THE IRON TRADE REVIEW

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Very Low Prices Develop New Business

Philadelphia District Becomes Center of Strong Competition— New Tin Plate Price a Surprise—Large Order for Steel Line Pipe

The making of extremely low prices on finished materials has stimulated considerable new business in some sections, but the volume of new orders is less than for the first half of last month. There is hope that this will be made up before the close of the month. Wire mills are operating about 85 per cent capacity. The railroads seem to be coming nearer to the point of making important purchases, but not much increase in tonnage from this source has yet developed. The lowest price yet made in plates and shapes developed in the Philadelphia district in competition for material for new vessels, but in other sections competition has not been productive of such low prices.

Pig Iron

In the Pittsburgh district, 30,000 to 40,000 tons of basic pig iron have recently been quietly disposed of in exchange deals. A consumer in the Chicago district has been sounding the market for from 15,000 to 20,000 tons of basic, which would probably be shipped from the Buffalo district. An inquiry for 5,000 tons of basic is pending in Philadelphia. The leading cast iron pipe company has not purchased the large tonnage of foundry grades reported, but is ready to buy at prices which it has named. Sales in New York and New England territory for foundry grades aggregate from 12,000 to 15,000 tons. The co-operation of English makers of ferro-manganese has not been able to hold the market at $38.50, Baltimore, and several thousand tons have been sold at a dollar below that figure. Inquiry for considerable tonnage is still pending.

Pipe

Recent large orders and inquiries for steel line pipe have improved the tone of the market for this product very much. The Republic Iron & Steel Co. has taken a contract for 150 miles of 6-inch steel line pipe for The Texas Co., and a western company has entered the market for 250 miles of 8 and 10-inch pipe for oil and gas line construction. This business, with the 40,000 tons recently taken by the National Tube Co., for Canadian shipment, represents the largest tonnage which has been on the market at one time in a number of years. On Oct. 31, New York City opens bids for from 6,500 to 7,000 tons of cast iron pipe for another section of the Catskill aqueduct. The 9,200 tons for aqueduct work recently awarded contractors, has not yet been allotted to foundries.

Structural Material

Contracts amounting to about 75,000 tons of structural material are pending in the east and a very fair number of awards have recently been made. The American Bridge Co. has taken 5,000 tons for New York subway work. A. E. Norton & Co. have the contract for the Y. W. C. A. building, New York, 1,200 to 1,500 tons. Additions to Bellevue hospital, New York, 1,200 tons, will be erected by the McClintic-Marshall Construction Co., which has also taken 850 tons for an addition to the Algoma Steel Co. plant at the Soo. The John Birkle Iron Works has taken 900 tons for St. Anthony hospital, Woodhaven, L. I. Recent export orders include 2,000 tons for Buenos Ayres, and 1,200 for the Corean government, taken by the American Bridge Co., and 5,000 tons of reinforcing bars for wharf construction at Havana, awarded the Carnegie Steel Co.

Plates and Shapes

Some sheet manufacturers report a very gratifying increase in orders taken at fair prices. Mill orders for sheets during the first half of October exceed those for the first half of September. An eastern ship building company obtained the extremely low quotation of 1.25c, delivered, equivalent to 1.10c, Pittsburgh, on about 5,000 tons of shapes and plates for two boats recently contracted for. It is understood that the shapes will be rolled at a nearby plant, but that the plates will be shipped from Pittsburgh. Other mills, although actively seeking business, will not in all cases meet recent low quotations. About 14,000 tons of plates are pending for the four American-Hawaiian Steamship Co.'s boats, recently awarded.

Tin Plates

The surprise of the week was the announcement of the price of $3.40 per base box on tin plate, a reduction of 20 cents per box, or about $4 a ton below the price, which has prevailed for the past 60 days. This quotation is being made by some independent companies for delivery throughout next year. It was expected that the price would be $3.50. There has recently been a very decided decrease in shipments.

WORLD'S IRON MARKETS

PITTSBURGH

Tonnage Increases as Prices Fall—Reduction in Tin Plate.

Office of THE IRON TRADE REVIEW,
2148-49 Oliver Bldg., Oct. 17.

In point of tonnage, the local iron and steel market is making a better showing than in August and September, due largely to the extremely low prices on all materials and a more cheerful tone is noted in some quarters. In numerous instances, reports of low prices are due to the fact that the policy of quoting f. o. b. makers' mill, regardless of location, instead of the original basing point, has become more general. This practice started a few weeks ago by Ohio sheet mills giving away part of their freight advantage and has been followed by similar action by manufacturers of billets, sheet bars, steel bars, plates and wire products. Perhaps the most important development in the market during the week was the cut in the price of tin plate, effective Oct. 16, of 20 cents per base box or $4 a ton, as compared with the market level during the past 60 days, and 30 cents per base box or $6 a ton as compared with the so-called official price established Feb. 3, 1911. Some independents have quoted the new price for delivery over all of next year. The Texas Co. has awarded a contract to the Republic Iron & Steel Co. for 150 miles of 6-inch steel line pipe and a western interest has entered the market for 250 miles of 8 and 10-inch steel line pipe for oil and gas line construction. The above order and inquiry, together with the Canadian business booked several days ago by the National Tube Co., represents a total of from 63,000 to 69,000 tons. Promise of liberal buying by transportation companies has given the market in general a better tone. A number of the larger inquiries for freight cars previously referred to are on the point of being closed and formal inquiries for 1912 steel rail requirements likely will be put out within the next few weeks by several large trunk lines. Some of the steel companies in this section are figuring upon increased mill activities during the remainder of the month.

Pig Iron.—Consumers of all grades of pig iron are sending in urgent requests for shipments against running contracts and two or three furnaces report shipments considerably in excess of production, with the result that stocks in furnace yards in the valleys have been greatly reduced. No particularly large sales have been made during the week, but numerous sales of malleable and foundry grades in small lots have been made for early shipment. The low prices quoted on all grades of pig iron are attracting the attention of consumers and there is more quiet figuring on forward requirements than appears on the surface. A local interest is in the market for 1,000 tons of malleable for early shipment. We note a sale of 300 tons of this grade at $13.25, valley furnace, for western shipment. A western consumer has also taken 500 tons of basic pig iron at about $12.50, valley, this figure representing the market level. A nearby furnace has disposed of additional basic iron in exchange transactions and the total tonnage disposed of by this company in exchange deals during the past 60 days is estimated at from 30,000 to 40,000 tons. The Bessemer market is quiet, there being no important sales and little inquiry. This grade is being offered at $14.50, valley, for delivery this year, although reports that a lower price has been quoted lack confirmation. The Southside, Pittsburgh, furnace of the Clinton Iron & Steel Co., which was to have been blown in this week, will not go in for another week at least. We quote the market as follows:

(Prompt Shipment.)

Bessemer, valley	$14.50
Bessemer, Pittsburgh	15 40
Basic, valley	12.50
Basic, Pittsburgh	13.40
No. 2 foundry, Pittsburgh	14.40
Gray forge, Pittsburgh	13.90
Malleable, Pittsburgh	14.00

(Fourth Quarter.)

Besemer, valley	$14.50
Besemer, Pittsburgh	15.40
Basic, valley	12.50
Basic, Pittsburgh	13.40
No. 2 foundry, Pittsburgh	14.40
Gray forge, Pittsburgh	13.90
Malleable, Pittsburgh	14.00

Ferro-Alloys.—Pending inquiries for ferro-manganese involve approximately 5,000 tons, chiefly for western shipment. Owing to the fact that $37, seaboard, can be done on this material for prompt delivery and that sellers are asking an advance of $1 to $1.50 for first half delivery, some consumers have revised inquiries, agreeing to take some of the material this year. While there is not much demand for 50 per cent ferro-silicon, prices appear to be well maintained and a few carloads have been sold at $60, seaboard. The lower grades of domestic ferro-silicon have been sold from $1 to $2 a ton below the market level established some months ago.

We quote ferro-manganese at $36.75 to $37 Baltimore, for prompt shipment, and at $37.50 to $38.50, Baltimore, for forward delivery. The freight rate from Baltimore to Pittsburgh is $1.95 per ton.

Fifty per cent ferro-silicon is quoted at $59 to $60, Pittsburgh, for prompt and forward delivery; 12 per cent, $24; 11 per cent, $23; 10 per cent, $22, f. o. b. Jackson, Jisco and Ashland furnaces. The freight rate to Pittsburgh is $1.90. The foreign grades are held at $1 or more a ton over domestic prices.

Plates.—The railroads are showing more interest in their equipment requirements than for a long time, due largely to the fact that exceedingly low prices have developed recently on plates and other material used in their construction and to the fact that there has been a decided reduction in the number of idle cars throughout the country. While no particularly large awards for cars have been made in this territory, a number of the larger inquiries referred to in previous reports are on the point of being closed and car builders and steel manufacturers expect the placing of some large awards within the next few weeks.

It is conservatively estimated that pending inquiries involve upward of 20,000 cars. Conflicting statements are made concerning the number of cars on which bids are being taken by the various roads, although it is known that some of the roads which bought cars recently are figuring upon additional equipment. The Pennsylvania Railroad Co. has awarded a contract to the Pressed Steel Car Co. for 50 passenger cars of various types and the Long Island Railroad Co. has ordered 40 passenger cars from the

American Car & Foundry Co. There is a large amount of boat construction being figured upon in the east and local mills likely will furnish a large portion of the plate tonnage. Notwithstanding the large tonnage under actual negotiation some extremely low prices have been made on plates and sales have been made at less than 1.20c, Pittsburgh. We quote the market as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches, 1.20c. Extras are as follows, per 100 pounds: Boiler and flange steel plates, 0.10c; A. B. M. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches, 0.10c; circles, 0.20c. Plates in widths over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ½ inch to and including ⅜-inch plate on thin edge, 0.10c; under ⅜ and including No. 9, 0.25c. Five cents extra for less than carloads. Terms net cash in 30 days.

Sheets.—Mill orders for sheets during the first 15 days of October exceeded those of the corresponding period last month. When figured on a Pittsburgh basis some of the smaller mills continue to make extremely low quotations on prompt delivery business, as some of the western manufacturers are quoting f. o. b. their mill, regardless of location. However, no sales have been openly reported below 1.85c, for black sheets No. 28 gage, 2.90c for galvanized sheets No. 28 gage, and 1.40c for blue annealed sheets No. 10 gage, f. o. b. maker's mill. One or two of the larger independents continue to operate practically full, while the leading interest is operating at slightly over 72 per cent of its capacity. We quote the market as follows:

Blue annealed sheets No. 10 gage, 1.40c; black annealed sheets No. 28 gage, 1.85c to 1.90c; galvanized sheets, No. 28 gage, 2.90c; painted roofing sheets, $1.30 per square for No. 28 gage, 2½-inch corrugation; galvanized roofing sheets, $2.50 per square for No. 28 gage, 2½-inch corrugation f. o. b. makers' mill.

Tin Plate.—The American Sheet & Tin Plate Co. and independent manufacturers on Oct. 16 opened their books for 1912 business and announced to the trade a price of $3.40, f. o. b. Pittsburgh, on 14 x 20 100-pound cokes, which is a reduction of 20 cents per base box or $4 a ton, as compared with the market level for the past 60 days, and a reduction of 30 cents per base box or $6 a ton as compared with the price established Feb. 3, 1911, when there was an advance of 10 cents per base box, or $2 a ton. The reduction applies to all coated products and all charcoal plate. On Sept. 28, 1909, the price was advanced from $3.40 to $3.50, Pittsburgh, and on Nov. 11, 1909, there was another advance of $2 a ton. Shipments of tin plate in August and September were heavy, although there has been a decided falling off in shipments and mill operations during the past two weeks, some companies curtailing production approximately 50 per cent. We quote the market as follows:

Coke tin plate, 100-pound basis, 14 x 20, $3.40 f. o. b. mill, Pittsburgh district.

Rails and Track Material.—It is expected that within the next fortnight formal inquiries will be put out by several of the larger trunk lines for their 1912 requirements. Estimates of the 1912 requirements are now in the hands of the executive officers, and, while the initial inquiries to be put out by some of the railroads will not involve very heavy tonnage as compared with those of recent years, the aggregate tonnage will be heavy. A number of the trunk lines during the past few weeks have placed orders for fair sized lots of standard rails for early delivery, the leading interest having booked several thousand tons of standard rails and 3 000 or 4,000 tons of light rails during the past week. Rail mills are running on about the same basis as last month. Buying of standard railroad spikes is only moderate and some low prices have been quoted. We quote the market as follows, the base price on open-hearth steel rails being 1.34c per pound at the mill:

Fifty-pound and heavier, 1.25c per pound; carloads and less than 500 tons, 1.34c per pound; light rails on base weight of 40 to 45 pounds, 1.16c, the schedule on the other weights being irregular and subject to negotiations; angle splice bars for standard sections, 1.50c, Pittsburgh; track bolts, 2.20c to 2.25c, Pittsburgh.

Railroad Spikes.

4½, 5 and 5½ and 9/16	$1.40
3, 3½, 4, 4½ and 5 x ½	.10
3½, 4 and 4½ x 7/16	.20
3, 3½, 4 and 4½ x ⅜	.30
2½ x ⅜	.40
2½, 3 and 3½ x 7/16	.60
2 x 7/16	.80

Steel. — Liberal specifications have been received against contracts for billets and sheet bars with the result that the Carnegie Steel Co. and one or two of the larger independent companies continue to operate their semi-finished steel mills practically full. The policy of quoting f. o. b. maker's mill regardless of location, instead of Pittsburgh or Youngstown, has become more general, so that on recent sales, when figured back to a Pittsburgh basis, open-hearth and Bessemer billets have sold below $19 and $20, Pittsburgh, respectively, although no sales have been reported below these prices at maker's mill. That the low prices established recently are attractive to buyers is shown by the fact that during the past week several additional large users have made firm offers to contract for their full requirements over the entire year of 1912 at today's prices. Owing to the fact that most users are covered by contract, there has been little fresh buying during the week. Demand for forging billets is light and sales are confined to small lots. We quote the market as follows:

Bessemer 4 x 4 billets with 0.25 carbon and less are quoted at $20, with the usual extras for size and analysis, and open-hearth rolling billets, $19; Bessemer sheet and tin bars are quoted at $21, and open-hearth sheet bars are quoted at $19.50 to $20, f. o. b. maker's mill, with full freight to destination added. Forging billets are quoted at $25, Pittsburgh.

Hoops and Bands.—New business is light and specifications against contracts are only fair. Prices appear to be fairly firm, although the market has not been tested. We quote the market as follows:

Hoops in carload lots, 1.35c, Pittsburgh; in less than carload lots, 1.45c; bands, 1.15c, base, with net extras, as per standard steel.

Merchant Bars.—Local manufacturers report a slightly better demand for steel bars. On account of the low prices quoted by some mills, the larger manufacturers are beginning to show more interest in forward requirements and in several instances offers have been made to contract for first half at today's market level, but local mills will not quote the low prices except on business for early shipment. Demand for bar iron continues light, no important trading having been reported. Manufacturers of shafting report fair specifications, with a slight increase in new business. We quote the market as follows:

Common iron bars, 1.25c, Pittsburgh; Bessemer and open-hearth steel bars, 1.10c to 1.15c plow and cultivator, 1.20c; channels, angles, zees, tees, under 3 inch, 1.25c, all f. o. b. mill. The following differentials are maintained on steel. Less than 2,000 pounds of a size, 0.35c advance. Cold rolled and ground shafting, 60 and 5 per cent to 60 and 10 per cent off in carloads and 57 per cent in less than carloads, delivered in base territory.

Muck Bar. — No new inquiry has appeared in this market and in the absence of any sales, we continue to quote muck bar nominally at $28, Pittsburgh, with a premium of $1 a ton for all pig iron muck bar.

Structural.—The McClintic-Marshall Construction Co. has received contracts for an addition to a New York city hospital, involving 1,200 tons of steel;

850 tons of steel for an addition to the Algoma Steel Co.'s plant at Saulte Ste. Marie, and approximately 2,000 tons in scattered lots for small buildings. The Pittsburgh Bridge & Iron Works, Pittsburgh, has received the contract for the construction of a new testing laboratory and addition to the government testing station, Pittsburgh, involving 700 tons of steel. The Thompson-Starrett Co. has been awarded a contract for a 10-story brick and stone bank and office building, to be erected at Charleston, W. Va., involving about 500 tons of steel. Competition for new business is very keen and prices are not very firm. We quote the market as follows:

Beams and channels, 15 inches and under, 1.20c; over 15 inches, 1.35c; zees, 1.25c; tees, 1.30c; angles, from 3 to 6 inches, 1.25c; over 6 inches, 1.35c; universal and sheared plates, 6¼ inches wide and wider, 1.25c.

Merchant Pipe. — The market on line pipe shows a decidedly more cheerful tone as a result of recent large orders and inquiries involving heavy tonnages. The Republic Iron & Steel Co. has been awarded a contract for 150 miles of 6-inch steel line pipe for The Texas Co. A western interest has entered the market for 250 miles of 8 and 10-inch steel line pipe for oil and gas line construction. This inquiry with the order given to the Republic involves a total of from 23,000 to 29,000 tons. This business with the 40,000 tons taken several days ago by the National Tube Co., for Canadian shipment, represents the largest tonnage of line pipe that has been on the market at one time in years. As far as the construction of new lines this year is concerned, the season for 1911 is about over, although some fairly large projects for 1912 construction are under negotiation. Jobbers are specifying rather liberally against contracts for merchant iron and steel pipe and discounts are being maintained. We quote the following official discounts in carload lots, subject to the usual preferential discount to the larger buyers, merchant pipe, where specified, being offered in from ⅛ to 6 inches:

Iron and Steel Pipe Basing Prices.

	Steel.		Iron.	
	Butt weld.			
	Black.	Galv.	Black.	Galv.
⅛, ¼ inch	73	53	68	48
⅜ inch	74	64	69	59
½ inch	77	67	72	62
¾ to 1½ inch	80	72	75	67
2 to 3 inches	81	74	76	69
	Lap weld.			
2 inches	77	70	72	65
2½ to 4 inches	79	72	74	67
4½ to 6 inches	78	70	73	65
7 to 12 inches	76	66	71	61
13 to 15 inches	..	..	47	..
Extra Strong, Plain Ends.				
		Butt weld.		
⅜, ¼, ⅛ inch	70	60	65	55
½ inch	75	69	70	64
¾ to 1½ inch	79	73	74	68
2 to 3 inches	80	74	75	69
Extra Strong, Plain Ends.				
		Lap weld.		
2 inches	76	70	71	65
2½ to 4 inches	78	72	73	67
4½ to 6 inches	77	71	72	66
7 to 8 inches	70	60	65	55
9 to 12 inches	65	55	60	50
Double Extra Strong, Plain Ends.				
		Butt weld.		
½ inch	65	59	60	54
¾ to 1½ inch	68	62	63	57
2 to 3 inches	70	64	65	59
Double Extra Strong, Plain Ends.				
		Lap weld.		
2 inches	66	60	61	55
2½ to 4 inches	68	62	63	57
4½ to 6 inches	67	61	62	56
7 to 8 inches	60	50	55	45

Plugged and reamed pipe is furnished at 2 points higher price, either butt or lap weld.

Boiler Tubes.—Specifications against contracts for both merchant and locomotive boiler tubes are somewhat heavier, although fresh buying is light and considerable irregularity in prices is noted. We quote the official discounts on steel boiler tubes in carload lots as follows:

1¼ to 2¼ inch	65
2½ inch	67½
2¾ to 3¼ inch	72
3½ to 4½ inch	75
5 and 6 inch	67½
7 to 13 inch	65

To destination east of Mississippi river will be sold at delivered discount for carloads lowered by 2 points, for lengths 22 feet and under; longer lengths, f. o. b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire Products. — Orders for wire products during the past 60 days have been heavier than reported, and as a result, some mills are in a very comfortable position and are not offering concessions, even on business for immediate shipments. Owing to the increased capacity in the western Pennsylvania field, new orders and specifications are still below the capacity of the mills. In one or two instances, small mills have given away part of their freight advantage, although $1.45 for plain wire and $1.65 for wire nails are reported as the minimum. Demand for cut nails is very light and sales have been made on a basis of $1.55, Pittsburgh. We quote the market as follows:

Wire nails, jobbers' carload lots, $1.65 to $1.70; retailers' carload lots, $1.75 to $1.80; cut nails (western makers), jobbers' carload lots, $1.55; painted barb wire, jobbers' carload lots, $1.65 to $1.70; retailers' carload lots, $1.80, with 30c for galvanizing; plain wire to jobbers in carloads, $1.45 to $1.50, and to dealers, in carloads, $1.55 to $1.60; polished staples, $1.70; galvanized staples, $2.

Wire Rods.—The capacity of the wire rod mills is still in excess of demand and buyers are having no trouble in doing $26, Pittsburgh, although it would take a very desirable specification to shade this price. We quote, $26, Pittsburgh, on Bessemer and open-hearth wire rods.

Coke.—Aside from several sales of furnace coke for spot shipment, aggregating between 5,000 and 6,000 tons, there has been little trading in this market during the week. The sales referred to above were made at $1.50, ovens, which appears to be the minimum on spot furnace coke. There have been no sales of furnace coke for delivery into the new year, although a few of the furnace interests are understood to be quietly sounding the market. On spot furnace coke for delivery up to Dec. 1, sellers continue to ask $1.60, ovens. There has been no important trading in foundry coke and prices are unchanged. Consumers of both foundry and furnace coke continue to accept liberal shipments against contracts and producers have been successful in regulating production to consumption. Producers' yards are free of stock coke. Production last week showed no material change from the preceding week. We quote standard Connellsville furnace coke for prompt shipment at $1.50 to $1.55, ovens, and for delivery over the remainder of the year at $1.60, ovens. On high grade Connellsville foundry coke we quote from $1.80 to $1.95, ovens, for prompt shipment, and from $2 to $2.40, ovens, on contract. The Connellsville *Courier's* figures for the week ending Oct. 7 show 26,059 active ovens with an output of 314,343 tons, as compared with 26,034 active ovens and a production of 313,652 tons the previous week.

Old Material. — Further weakness has developed in the local scrap market, prices on several grades being reduced from 25 cents to 50 cents a ton, making the lowest quotations on these grades in years. Aside from scattered sales of cast borings in fairly large lots, there has not been much trading during the week. Shipments are still being held up by several of the larger consumers and dealers and producers find it difficult to dispose of their holdings. We note a reduction of 25 cents a ton on cast borings and machine shop turnings and a reduction of 50 cents a ton on malleable stove plate and No. 1 wrought scrap. We quote, gross tons, delivered in the Pittsburgh district, including Monessen, Sharon, Steubenville, Brackenridge and Follansbee, as follows:

Heavy melting scrap	$12.00 to 12.50
Rerolling rails	12.50 to 13.00
Malleable	11.50 to 12.00
Bundled sheet scrap	10.00 to 10.50
Iron axles	22.00 to 23.00
Old iron rails	14.50 to 15.00
Stove plate	9.00 to 9.50
No. 1 wrought scrap	12.50 to 13.00
Old car wheels	12.25 to 12.75
Low phosphorus	14.50 to 15.00
Machine shop turnings	8.75 to 9.00
Cast borings	8.00 to 8.50
No. 1 cast scrap	12.50 to 12.75

Thomas Jefferson Neacy, president and general manager of the Filer & Stowell Mfg. Co., Milwaukee, has presented a complete Corliss engine to the college of engineering of Marquette University, Milwaukee.

Many Sales of Finished Materials in Small Tonnages.

Office of THE IRON TRADE REVIEW,
1328 Monadnock Block, Oct. 17.

The volume of specifications taken by the western subsidiaries of the United States Steel Corporation so far this month compares favorably with September, but current sales during the past week have shown a decrease. This is attributed largely to a lack of railroad buying. A general survey of the situation indicates that specifications and new orders are just about holding their own at present. There is no doubt that the demand for finished materials is broadening in character, but the business at present consists largely of orders for small quantities which do not make the aggregate tonnage very large. The fact that a great many small consumers are entering the market freely is, however, a very favorable indication. Steel bars are now pretty firmly established in the Chicago market on a basis of 1.33c, for shipment over this year. Some bar iron has been sold recently at 1.18c, Chicago, for immediate shipment. Largely on account of eastern competition, plates are selling in the local market at 1.38c. Although the scrap market is showing some resistance, lower prices are noted in several instances.

Pig Iron.—The week under review has been rather devoid of interest. Orders for southern iron are moderate and although the furnaces are now quoting on first quarter business rather freely, only a comparatively small tonnage has been placed up to the present time. The prevailing price for southern No. 2 foundry, $14.35, Chicago, will be made when orders include shipment over both this quarter and the next. While some of the stronger furnaces are holding out for $10.50, Birmingham, for first quarter delivery alone, others are making a price of $10.25.

In the market for northern iron, the tendency is toward lower prices. There is strong evidence that some tonnage has been placed recently at concessions of from 25 to 50 cents under the generally prevailing price.

The following prices represent the market for Chicago delivery, except northern foundry No. 2 and malleable Bessemer made in local furnaces, which are quoted, f. o. b. furnace:

(Shipment this year.)

Lake Superior charcoal	$17.00
Northern foundry No. 2	14.50
Southern foundry No. 2	14.35
Southern silveries, 5 per cent silicon	16.10
Jackson Co. silveries, 8 per cent	18.40
Malleable Bessemer	14.50
Alabama basic	14.60

Billets.—The demand for billets is fairly wide, but the quantities involved are insignificant. Prices are a little weaker. We quote, open-hearth forging billets, $25 to $26, Chicago; rerolling billets, $22.60, Chicago.

Merchant Bars.—Reports regarding the merchant steel situation are somewhat mixed. It is understood that the volume of specifications taken by the leading interest so far this month compares favorably with September, while current sales during the past week have shown a decrease. This decrease is attributed largely to a lack of railroad buying. On the other hand, at least two of the leading independent companies represented in this market report specifications and current sales during the first two weeks in October to be 12 per cent heavier than during the corresponding period in September. Specifications from agricultural implement makers are fairly satisfactory and the fact that each specification is accompanied by a request for immediate shipment indicates that stocks in the hands of this class of consumers are low. There is no question that the demand for finished materials is broadening and that all things considered the tonnage is holding up remarkably well. The past week, however, has seen no improvement in prices. Steel bars are now pretty firmly established in the Chicago market on a basis of 1.33c for shipment over the remainder of the year. Bar iron mills are operating about 50 per cent of their capacity and some sales have been made on attractive business for immediate shipment at 1.18c, Chicago.

We quote, Chicago delivery, as follows:

Bar iron, 1.18c to 1.23c; hard steel bars, rerolled, 1.20c to 1.25c; soft steel bars and bands and small shapes, 1.33c to 1.38c, base; hoops, 1.53c to 1.58c; smooth finished machinery steel, 1 inch and larger, 1.78c. Shafting 60 per cent off list for carload lots, 55 per cent off for less.

On iron and steel from local stock, we quote as follows:

Bar iron, 1.55c to 1.65c per pound base; soft steel bars, 1.55c to 1.65c per pound base; soft steel hoops, 1.80c to 1.90c, full extras.

Structural Material.—The volume of fabricating contracts is not keeping up to expectations. While the commercial demand for plain material is fairly satisfactory, the tonnages involved are light. There have been no large contracts let in this market for several weeks, with the exception of the Field Museum, and prices are feeling the absence of sustaining orders calling for large tonnages. Furthermore, the tendency toward the establishment of a local basing point is a marked feature of the structural trade in the west at present. Beams and channels, 15 inches and under, are now selling at 1.38c, Chicago, equivalent to 1.20c, Pittsburgh.

The Calumet & Hecla Mining Co. has let a contract for a shaft house, 400 tons, to the Worden-Allen Co. The American Bridge Co. has taken 348 tons from the Pacific Gas & Electric Co. for a power house at Sacramento, Cal. The Chicago, Milwaukee & St. Paul railway has awarded 400 tons to the Morava Construction Co. for the Milwauke avenue viaduct, Chicago.

We quote, structural material, f. o. b. Chicago, as follows:

Beams and channels, 15 inches and under, 1.38c. For extras, see Pittsburgh report.

Plain material out of store is as follows:

All angles, 3 inches and larger, including 6 inches, $1.65 to $1.75 per 100 pounds; angles over 6 inches, $1.75 to $1.80 per 100 pounds, base; beams, 3 to 15 inches, inclusive, $1.65 per 100 pounds, base; channels, 3 inches and larger, $1.65 per 100 pounds, base.

Rails and Track Fastenings.—During the latter part of September several railroads showed some interest in their rail requirements, but this ripple of activity seems to have subsided completely. There are no inquiries in the market of consequence and orders for track fastenings are extremely light at present. Business in light rails is fairly satisfactory, but prices are very irregular. Local mills have been able to help out their rolling schedules recently through their ability to take foreign business. There is considerable inquiry from Canada and the Canadian Pacific is considering offers on its inquiry for 50,000 tons, issued some time ago. Local mills have a good chance to secure a portion of this business. The Southern railway has ordered 2,100 tons from the Tennessee Coal, Iron & Railroad Co.

We quote, light rails, f. o. b. Chicago, and track fastenings, f. o. b. Joliet, as follows:

Light rails, carloads, 40 to 45-pound, 1.16c to 1.20½c; 30 to 35-pound, 1.19½c to 1.24c; 16, 20 and 25-pound, 1.20½c to 1.25c; 12-pound, 1.25c to 1.29½c.

Light section relayers, 45 pounds and under, subject to inspection, $21 to $23; standard section relaying rails, subject to inspection, $23.50 to $24.

Track fastenings, f. o. b. Joliet, angle bars,

1.50c to 1.60c; railroad spikes, 1.60c to 1.70c; smaller size spikes, 1.70c, base; track bolts with square nuts, 2.10c, base.

Plates.—Local mills are fairly well supplied with business, due particularly to liberal car orders placed in the west during the past four weeks, but prices are low due to vigorous competition from Ohio mills shipping into this territory. The existence of this competition is held responsible for the prevailing price, which is 1.38c, Chicago, for tank plates in base sizes. The Erie has ordered 300 automobile cars from the American Car & Foundry Co. With the exception of an inquiry from the Chicago, Rock Island & Pacific for 500 furniture cars and 250 flat cars, there is no new car business in the western market at present.

We quote, mill prices, f. o. b. Chicago, as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches wide, 1.38c. For extras, see Pittsburgh report.

Store prices are as follows:

Tank steel, ¼ inch and heavier, up to 72 inches wide, 1.65c.

Sheets.—No features of interest are noted in the sheet market and conditions remain practically unchanged. The recent reduction in store prices has had no particular effect on the volume of business. Little improvement, if any, can be noted in the prevailing price situation, although the tonnage continues to be remarkably well sustained.

For mill prices, see Pittsburgh report. Freight to Chicago, 18 cents.

We quote, store prices, f. o. b. Chicago, as follows:

Blue annealed, No. 10, 1.95c; No. 12, 2.05c. Box annealed, No. 28, 2.40c. Galvanized, No. 28, 3.35c.

Wire Products.—Running orders for barb wire and fencing from agricultural centers remain very satisfactory. The nail business, however, is somewhat slow, although showing a little improvement. In general specifications against contracts are not quite as heavy as they were in September, but local mills continue to run at about the same rate as they did last month.

We quote, f. o. b. Chicago, as follows:

Wire nails, jobbers, carload lots, $1.88; retailers' carload lots, $1.93; retailers' less than carload lots, $2.03; painted barb wire, jobbers' carload lots, $1.88; retailers' carload lots, $1.93; retailers', less than carload lots, $2.03, with 30c for galvanizing; plain wire to jobbers, $1.68; plain wire, retailers' carload lots, $1.73.

Merchant Pipe and Tubes.—Improved labor conditions are stimulating the local market for merchant pipe to some extent and the lower prices announced recently are having a favorable effect. The demand for boiler tubes remains light with price conditions irregular. Boiler makers are not disposed to contract for advance shipment under present market conditions.

We quote, merchant pipe and tubes, out of stock, f. o. b. Chicago, as follows:

Iron and Steel Pipe Basing Prices.

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
⅛-¼ inch	70.2	49.2	63.2	41.2
¼ inch	74.2	63.2	66.2	56.2
2 in. to 3 in.	78.2	70.2	72.2	64.2
4½-6 inches	75.2	66.2	69.2	60.2
7-12 inches	72.2	61.2	67.2	56.2
Extra Strong Plain Ends.				
½ inch	71.2	64.2	54.2	52.2
2-3 inches	76.2	69.2	61.2	55.2
7-8 inches	66.2	55.2	59.2	47.2
Double Extra Strong.				
¼ inch	59.2	51.2	....	....
2-3 inches	64.2	56.2	....	....
7-8 inches	54.2	42.2	....	....

Tubes.

	Lap weld steel. Per cent.	Charcoal iron. Per cent.	Shelby seamless. Per cent.
1 inch	39	..	57½
1¼ to 2¼ inch	55	40	35
2¾ to 3¼ inch	65	50	46

Cast Iron Pipe.—No orders of consequence were placed in the west last week. Bids were opened on Oct. 11 at Long Beach, Cal., for 1,700 tons of water pipe, but no award has been made up to date. On Oct. 18 bids were opened in Chicago on 500 tons of 8-inch pipe. Woodstock, Ill., is in the market for 250 tons of water pipe. Routine business is satfactory and makers are still behind on their deliveries of 4-inch pipe.

We quote, f. o. b. Chicago, as follows:

Four-inch water pipe, $26.50; 6 to 12 inches, $24.50, larger sizes, $24; gas pipe, $1 a ton higher.

Old Material.—Although the market is showing some resistance, prices are being forced to lower levels in several instances. In addition to the large amounts of material on hand, the scrap market is further depressed on account of the low price of bar iron. Current quotations on heavy melting steel are $10 per gross ton, Chicago, and the same price has been made on No. 1 railroad wrought, which is sold by the net ton. No. 1 cut boiler scrap has been reduced 50c a ton and steel angle bars have declined 25c.

We quote, for delivery in consumers' yards, Chicago, as follows:

GROSS TONS.

Old car wheels	$12.50 to 13.00
Old iron rails	14.50 to 15.00
Rerolling rails (5 ft. and over)	12.25 to 12.75
Old steel rails (3 ft. and under)	11.25 to 11.75
Frogs, switches and guards	10.00 to 10.50
Heavy melting steel	10.00 to 10.50
Shoveling steel	9.50 to10.00

NET TONS.

No. 1 R. R. wrought	$10.00 to 10.50
No. 2 R. R. wrought	9.00 to 9.50
Arch bars and transoms	13.50 to 14.00
Knuckles, couplers and springs	10.00 to 10.50
Shafting	14.00 to 14.50
Iron car axles	17.25 to 17.75
Steel car axles	15.50 to 16.00
Locomotive tires	14.00 to 15.00
Dealers' forge	9.25 to 9.75
Pipe and flues	7.00 to 8.00
No. 1 cast	10.50 to 11.00
No. 1 busheling	8.00 to 8.50
No. 2 busheling	6.00 to 6.50
No. 1 boiler cut	7.00 to 7.50
Boiler punchings	12.50 to 13.00
Cast and mixed borings	5.25 to 5.75
Machine shop turnings	6.00 to 6.50
Railroad malleable	9.75 to 10.25
Agricultural malleable	9.25 to 9.75
Angle bars, splices, etc., iron	12.00 to 12.50
Angle bars, steel	9.00 to 9.50
Stove plate and light cast scrap	9.25 to 9.75

CINCINNATI

Shipments Going Forward Freely—Inquiry is Very Light.

Office of THE IRON TRADE REVIEW, 808 Provident Bank bldg., Oct. 17.

Pig Iron.—Sales during the past week have been exceedingly light in this territory, and the general situation remains practically unchanged. Inquiry remains at low ebb, such as there is being for small lots only. A local steel concern is in the market for 500 tons of ferro-manganese and an Indiana melter is asking for about 300 tons of southern foundry grades, for this year's requirements. It is rumored that the southern Ohio steel mill that recently decided not to buy will be in the market for a round tonnage some time during November. Consumers are taking contract shipments in a very satisfactory manner, which is perhaps the brightest phase of the entire situation. Prices for southern iron appear to show a slight tendency toward weakness, and while established quotations are practically at last week's schedule, it is known that one or two of the large producers of the south are now willing to take a limited tonnage for the first quarter of next year on a $10 basis, although not openly quoting on this basis. Local foundry demand is quiet and featureless, with little interest taken in next year's requirements. Northern prices remain at established quotations at $13 for this year and $13.50 for next, Ironton, with sales light. It is intimated that one of the large cast iron pipe interests may buy a round block of iron in the near future. Freight rates from Birmingham, $3.25, and from Ironton district, $1.20. We quote at Cincinnati as follows:

Southern foundry No. 2	13.25 to 13.50
Southern foundry No. 3	12.75 to 13.25
Southern foundry No. 4	12.50 to 12.75
Southern gray forge	12.50 to 12.75
Mottled	12.25 to 12.50
Southern No. 1 soft	14.70 to 15.20

Southern No. 2 soft	14.20 to 14.70
Standard southern car wheel	25.50
Northern No. 2 foundry	14.20
Northern No. 3 foundry	13.70
Northern No. 4 foundry	13.20
Jackson county 8 per cent silicon	16.95

Coke.—There are no inquiries pending for furnace coke, consumers for most part being well covered for the remainder of the year. Foundry movement is confined almost exclusively to contract shipments excepting the general run of small buying for quick requirements. Prices so far as can be ascertained are unchanged and from the leading coke districts are about represented by the following schedule:

	Prompt shipment.	Contract second half.
Connellsville district:		
Foundry coke	$2.00 to 2.25	$2.00 to 2.40
Furnace coke	1.55 to 1.65	1.75 to 1.90
Wise county district:		
Foundry coke	2.00 to 2.25	2.00 to 2.25
Furnace coke	1.75 to 2.00	*Sliding [scale basis.
Pocahontas district:		
Foundry coke	2.00 to 2.10	2.00 to 2.10
Furnace coke	1.50 to 1.75	1.60 to 1.75
New river		
Foundry coke	2.50 to 3.15	2.60 to 3.25
Furnace coke	2.10 to 2.15	2.10 to 2.20

*Sliding scale basis means $1.60 for coke based on $9, Birmingham, for pig iron, with an advance of 16⅔ per cent of the amount over $9 at which pig iron is quoted. This is the usual basis. Other forms of sliding contracts are also made.

Finished Material.—Steel bars are quotable at 1.15c, Pittsburgh, and while there are some rumors of shading, appear to be reasonably well maintained at this figure. A fair demand is reported in the way of small buying, but nothing contemplating large tonnages is reported. Structural demand, so far as the local market is concerned, is quiet, with plates and shapes quoted on a 1.25c Pittsburgh basis. One large building now in contemplation, and for which the plans are not as yet completed, it is said will require in the neighborhood of 5,000 tons of steel.

Old Material.—There have been no special offerings during the week, and the market is quiet and dull. Dealers' yards show some accumulation, yet contract stocks are being moved out in a fairly satisfactory manner. Prices are still weak and fluctuate to some extent. Dealers say quotations are about represented by the following:

GROSS TONS.

Old iron rails, gross	$14.00 to 14.50
Old steel, rerolling, gross	13.00 to 14.00
Old iron axles, gross	19.25 to 19.75
Steel melting scrap, gross	11.00 to 11.75
Car wheels, gross	11.50 to 12.50

NET TONS.

Old No. 1 R. R. wrought	$12.25 to 12.75
No. 1 machinery	10.50 to 11.00
No. 1 busheling	9.25 to 9.75
Stove plate	7.75 to 8.25
Machine shop turnings	6.50 to 7.00
Cast borings	5.50 to 6.25
Grate bars	7.25 to 8.00
Sheet iron, bundled	8.00 to 9.00
No. 1 cast scrap	10.00 to 11.00
Heavy turnings	7.75 to 8.75

PHILADELPHIA

Plates and Shapes Reported at Lowest Prices—Iron Quiet.

Oct. 16.

Low prices for finished products seem to be paving the way for better tonnages for the mills, as a more substantial interest seems to be arising among eastern consumers because of the attractive opportunities for purchases. Some eastern plate mills are reporting this week an encouraging expansion of their orders. The low point to finished material prices is still dropping, as a tonnage of plates and shapes is understood to have been closed in this district the past week at 1.25c, delivered, or 1.10c, Pittsburgh. Pig iron is very quiet and buyers are declining to pay any advances for next year's metal. The scrap market continues to flounder at depressed prices.

Pig Iron.—Consumers of pig iron are apparently seeing no incentive for buying very far into the future, especially at the advances over early shipment prices which a number of the makers are asking for delivery after Jan. 1. The result is a very quiet market with purchases usually being scaled to small lots for early requirements. Such buying is quite steady in volume, however, since, as a rule, consumers have little iron in stock. Some buyers are showing a degree of interest for first quarter and first half delivery, but their ideas of price are usually below those of the furnaces, and as the latter also see no advantage in loading up at current values, the next year market is lagging. One northern New Jersey stove manufacturer is asking prices on 3,000 tons of 2X for first half and a number of smaller inquiries of this nature are out. No branch of the market shows any sizable activity, but some fair negotiations in steel-making grades continue to be advanced. One consumer in this territory has closed for its requirements of low phosphorus iron throughout next year, aggregating 3,000 to 5,000 tons, at $20, delivered. An eastern steel works is inquiring for 5,000 tons of basic for shipment over the balance of the year and into first quarter. The minimum price on this grade continues $14.50, delivered, for Lehigh and Schuylkill valley metal. There are no changes in prices in foundry grades. For the leading eastern Pennsylvania brands, the market is represented by $15 to $15.25, Philadelphia. Virginia 2X is quoted $12.25 to $12.50, furnace, the former principally for prompt shipment, though there are reports that one seller will accept this price for shipment up to Jan. 1. Some of the cast iron pipe companies show prospects of good sized buying soon, but no additional transactions of this class are reported. It is officially denied that the leading cast iron pipe maker has bought a very large tonnage, part of which it was reported would go to its plant on the Delaware river. The Thomas Iron Co. is planning to blow out either its Island Park or Hellertown furnace.

We quote for prompt and last quarter, at Philadelphia and vicinity, as follows:

No 1X foundry	$15.25 to 15.50
No. 2X foundry	15.00 to 15.25
No. 2 plain	14.50 to 14.75
Standard gray forge	14.25 to 14.50
Basic	14.50
No. 2X Virginia	15.05 to 15.30
No. 2 southern	14.00 to 14.50
Standard low phosphorus	20.00 to 20.50

Finished Material.—Some eastern mills have viewed with satisfaction this week a noticeable increase in the volume of tonnage entered, which on some days reached practically normal proportions. This improvement, which has been confined chiefly to plates has included some manifestation of stocking up by buyers because of the low prices quoted. Several boiler manufacturers especially seem to have decided that the present market offers favorable opportunities for accumulating some finished stock. Contrasted to such cases of increased tonnage are reports of some shrinkage in the business sent to the mills. Some eastern shape makers state their October tonnage is running below September.

It is becoming more apparent, however, that the acknowledged bargain level to which prices have been depressed, is more surely arousing the interest of buyers, which is including some of the eastern railroads, and if this condition has not already resulted in better orders for the mills, it seems more likely to do so. The especially low prices offered, while contributing to increase the tonnage, are also complicating the situation, and makers declare the present level cannot long prevail.

The lowest prices that have yet developed in this downward movement are coming out in this district. An eastern ship yard is understood to have covered for recent requirements of several thousand tons of shapes and plates at 1.25c, delivered, which is equivalent to 1.10c, Pittsburgh. For the plates on this order it was necessary for Pittsburgh makers to meet the freight advantages of eastern mills. The shapes are to

be furnished, it is understood, by a nearby plant. Plates and shapes are openly quoted at 1.35c, Philadelphia, or 1.20c, Pittsburgh, but 1.32½c or 1.17½c, Pittsburgh, on shapes, has been previously reported as having been done by Pittsburgh mills. Eastern mills are competing aggressively for business, but some of them say they will not go to the low points ascribed to Pittsburgh makers. The open quotation on steel bars is 1.15c, Pittsburgh, but this has been shaded. For open-hearth billets, $19, Pittsburgh, or $21.40, Philadelphia, is quoted.

An attractive quantity of plates, about 14,000 tons, is pending for the four American-Hawaiian Steamship Co. boats awarded the Maryland Steel Co., as previously reported. This tonnage will probably go to the Central Iron & Steel Co., Harrisburg. The New York Ship Building Co. has placed with Pittsburgh and eastern mills about 5,000 tons of plates and shapes for two boats recently taken for the Standard Oil Co. Another ship yard has closed for about 2,500 tons of shapes and plates for car barges.

In structural work, the general contract for the municipal convention hall, this city, upon which the Charles McCaul Co. is the low bidder, is still pending. Bids have gone in for the Heard building, Jacksonville, Fla., 1,600 to 1,800 tons, and for the Royster building, Norfolk, about 1,000 tons. The steel plans will soon be out for the Stock Exchange building, this city, which will require about 2,000 tons; also for the Vendig hotel and the Continental Title & Trust Co. building, plans for which are in preparation. Decisions are still pending on the Langham apartment, this city, about 1,000 tons; on the Hotel Dempsey, Macon, Ga., about 1,000 tons; on the Washington postoffice, 4,000 tons; on the Powhattan hotel, Washington, 500 tons; on the Baldwin Locomotive Works extensions, Eddystone, Pa., about 4,500 tons, and on the power house for the Lehigh Coal & Navigation Co., near Mauch Chunk, Pa., 1,000 tons. The Philadelphia Steel & Wire Co. has recently taken several thousand tons for small work in this territory.

We quote, delivered in Philadelphia and vicinity, as follows:

Structural shapes, 1.30c to 1.35c; steel plates, 1.30c to 1.40c; steel bars, 1.30c to 1.35c; common bar iron, 1.22c to 1.27c; cut nails, $1.75 to $1.80; blue annealed sheets, No. 10 gage, 1.55c to 1.60c; 4 x 4-inch open-hearth rolling billets, $21.40 to $22.40; forging billets, $26.40 to $27.40. Extras shown under Pittsburg report.

Old Material.—The market is in an unsettled state awaiting conditions in finished products to become more assured, as in the present situation the mills are buying sparingly and then largely in bargain offerings. It is believed that any consistent buying would materially harden old material prices and probably bring a quick reaction. The market continues to droop. Heavy melting steel is quotable about $12, delivered, a level which, though consumers are generally willing to offer, has resulted in some small sales this week. Sacrifice lots have gone as low as $11.75, delivered, it is reported. The monthly lists of eastern railroads, aggregating 30,000 to 40,000 tons, were closed at lower prices. The heavy steel went at $12 to $12.25, delivered, the No. 1 wrought at $13.80 to $14, delivered, and the car wheels at about $11.75, delivered.

We quote, gross tons, delivered in eastern Pennsylvania or New Jersey consuming territory, as follows:

Old iron rails	$16.00 to 16.25
Old steel rails (rerolling)	13.50 to 14.00
No. 1 heavy melting steel	12.00 to 12.25
Old car wheels	11.75 to 12.00
Old iron car axles	22.00 to 22.50
Old steel car axles	17.50 to 18.00
No. 1 R. R. wrought	13.75 to 14.25
Wrought pipe	11.50 to 12.00
Cast borings	7.50 to 8.00
Wrought turnings	8.25 to 8.75
Heavy cast scrap	12.50 to 12.75
Railroad malleable	11.25 to 11.75
Stove plate	9.25 to 9.75

Freight rates per ton on scrap from Philadelphia to principal eastern consuming points are: $0.60 to Ivy Rock, Pa.; $0.65 to Phoenixville, Pa.; $0.80 to Coatesville, Pa.; $0.85 to Bethlehem, Pa., Reading, Pa., and Roebling, N. J.; $1.10 to Pottsville, Pa., Lebanon, Pa., and Columbia, Pa., and $1.20 to Harrisburg and Steelton, Pa.

NEW YORK

Low Prices on Fnished Materials Stimulates Business Somewhat.

Office of THE IRON TRADE REVIEW, 1115 West Street Bldg., Oct. 17.

Iron Ore.—A Schuylkill valley furnace has purchased a small quantity of Mayari, Cuban ore, which will be used for its muxture. The ore was purchased in the natural state. Eastern furnaces are reluctant to purchase ore ahead, as is reflected by the recent offering of a tonnage for next year's shipment by Spanish sellers. Only about 50,000 tons for shipment up to March 1 was accepted at prices which are understood to have been lower than those ruling on this grade of ore the past year. Trans-Atlantic ocean freights are steady around 9s 6d from Mediterranean ports. A small lot of Bessemer ore for an eastern steel maker is under negotiation.

Pig Iron.—The United States Cast Iron Pipe & Foundry Co. on Saturday of last week closed for several small lots of iron, principally southern grades, upon which offers had been outstanding, but it is officially denied that this consumer has recently bought a heavy tonnage, the estimates of which in some reports have varied from 30,000 to 50,000 tons. This interest would undoubtedly purchase a round tonnage at its offers which are around $14, delivered, on northern lower silicon grades and below $10, Birmingham, on southern iron, but makers have not been willing to accept these. A considerable buying for foundry grades for shipment to New Jersey, lower New York and New England points has fallen within the week and sales of this class aggregate from 12,000 to 15,000 tons, some of which have been worked up quietly and others are the result of prolonged negotiations. The largest lot was about 3,000 tons of No. 2X for first quarter shipment for a northern New Jersey consumer. A good many of the sales are for early shipment, running up to Feb. 1, and in connection with the prompt manner in which consumers are taking iron on contract, they indicate the carrying of scant stocks by buyers. Some houses report some requests for anticipation of deliveries. As a rule, buyers are not disposed to pay any advances over this year's schedule for shipment after Jan. 1, and where the furnaces have been willing to accept current values for further forward shipment, considerable tonnage has been obtained. Buffalo makers have been booking considerable iron for first quarter and first half on the basis of $13.25 to $13.50, furnace, for No. 2X or $15 to $15.25, delivered in this territory. For No. 2 plain, $13, furnace, has been done. Eastern Pennsylvania grades are unchanged at $15 to $15.25, tidewater, or about $14.50, furnace, for No. 2X. Virginia iron is quotable at $12 to $12.25, furnace, for this year. Southern iron is again down at $10, Birmingham, for No. 2. There has been a little inquiry among malleable consumers in this territory. A Newark, N. J., buyer took 400 tons for first quarter at about $15.25, delivered. Middle western buyers of basic have been sounding out price conditions in the Buffalo territory and one of them has been tentatively considering the prices on 15,000 to 20,000 tons. We quote for prompt and last quarter shipment, at New York tidewater, as follows:

Northern foundry No. 1	$15.25 to 15.50
No. 2X foundry	15.00 to 15.25
No. 2 plain	14.50 to 14.75
No. 2 Virginia	15.05 to 15.30
No. 2 southern foundry	14.25 to 14.50

Malleable	15.00 to 15.25
Gray forge	14.25 to 14.50

Ferro-Alloys.—After having held off for several weeks on good sized negotiations, consumers of ferro-manganese have been enabled to close at $1 a ton under the $38.50, Baltimore, price generally asked by English makers for forward shipment. Sales of several thousand tons, including 1,000 to 2,000 tons for a Chicago buyer, 300 tons for St. Louis shipment and 500 tons for an Ohio river steel works, have been closed for first quarter and first half shipment at $37.50, Baltimore. These sales definitely gage the forward market, which at best has been nominal for several weeks. For prompt shipment, buyers have been offered material at $36.75, Baltimore. Some domestic sellers of 50 per cent ferro-silicon are quoting $62, Pittsburgh, but have made no sales at this price and there is reluctance to quote for next year. We quote 80 per cent ferro-manganese for prompt and forward shipment at $36.50 to $36.75, Baltimore, and 50 per cent ferro-silicon at from $57 to $59, Pittsburgh.

Cast Iron Pipe.—The city of New York will open bids Oct. 31 on 6,500 to 7,000 tons, principally of 48-inch pipe with some 36-inch pipe and specials for another section of the Catskill aqueduct. The 9,240 tons of 48-inch pipe and special for another section of this work in Brooklyn, which was recently awarded the contractors, is still pending before foundries and some very low prices have been made. The latest report is that a Camden, N. J., shop is the low bidder. The general market in cast iron pipe is showing no material change. We quote 6-inch pipe in carload lots at from $21 to $22, delivered, f. o. b. New York.

Finished Material.—More attention is undoubtedly being paid finished material by consumers because of the low values now ruling and in some directions this is stimulating the giving of serious consideration to the increasing of orders and in a few cases to the replenishment of low stocks. A continuance of present conditions bids fair to bring out a greater variety and volume of new business if for no other reason than the taking of advantage of present attractive prices, which makers assert cannot be long continued without disastrous results. It cannot be seen, however, that actual consumptive needs are increasing very rapidly and the market in this district, though more promising, has not been greatly improved in activity. Sharp competition is bringing out some low prices in random cases, but the market on plates and standard shapes is quotable at about 1.36c, New York, or 1.20c, Pittsburgh, and on steel bars at 1.31c, New York, or 1.15c, Pittsburgh. Bar iron is a little more active at about 1.15c, eastern mill, or 1.25c, New York.

There is a heavy tonnage of structural material pending in New York, Philadelphia, Washington and surrounding districts, which can be estimated at about 75,000 tons, but on some of the largest of these contracts, very deliberate action is being taken. The railroads seem to be holding up the limited tonnage of bridge work they have had before builders in eastern territory. The principal contracts awaiting decision in the New York district are 22,000 tons for the Madison Square Garden loft; 5,000 tons for the Hyde loft, 1,500 tons for the Locomobile Co. garage; 1,000 tons for the Baltimore & Ohio warehouse, and in railroad bridge work 1,500 tons for the New York Central, 1,000 tons for the Buffalo, Rochester & Pittsburgh and many other small contracts of miscellaneous nature.

Contracts of the week were fair. The American Bridge Co. was awarded by the general contractor, the Oscar Daniells Co., about 5,000 tons of material for section 12 of the Lexington avenue subway. The Y. W. C. A. building at Lexington avenue and Fifty-second street, 1,200 to 1,500 tons, has gone to the A. E. Norton Co. and the two pavilions for the Bellevue Hospital, this city, 1,200 tons, which were previously reported to have gone to another interest, are now stated to have been taken by the McClintic-Marshall Construction Co. Other awards of the week include 900 tons to the John Birkle Iron Works, for the St. Anthony Hospital at Woodhaven, L. I.; 600 tons for the St. John Baptist church, Lexington avenue and Seventy-sixth street, and 400 tons for a loft building on West Nineteenth street, both to the Hinkle Iron Works; 600 tons to the Hay Foundry & Iron Works for the Metropolitan Art Association, building, on East Fourteenth street, this city; 400 tons to the Bethlehem Steel Co. for the Goelett building on Fourth avenue, this city; 500 tons for the First National Bank building, Boston, and 500 tons for the St. James Theater, Boston, to the New England Structural Co.; 400 tons for the Savannah Hotel, Savannah, Ga., to Lauer & Harper, Baltimore; 200 tons to the Burlington Construction Co., for additions to the plant of Gilbert & Barker, West Springfield, Mass. In railroad work, the Virginia Bridge & Iron Works has 200 tons for the Seaboard Air Line, and the Boston Bridge Works, 250 tons for the Boston & Maine. The Pennsylvania Railroad has recently placed about 500 tons for small bridges in the east, including 360 tons at Trenton, N. J., to the Cambria Steel Co., previously reported. Recent export contracts include 2,000 tons for a large number of highway spans for the province of Buenos Ayres, South America, and 1,200 tons of plate girder works for the Korean government, both taken by the American Bridge Co., and 5,000 tons of concrete bars for wharf construction in Havana, awarded to the Carnegie Steel Co.

New boat construction in the east continues to attract attention. The New York & Porto Rico Steamship Co. is figuring on one large ocean going vessel and A. H. Bull & Co. are reported to be contemplating the award of two freight boats for coastwise service. We quote for delivery at New York tidewater, as follows:

Plain structural shapes, 1.36c to 1.41c; tank plates, 1.36c to 1.41c; steel bars, 1.31c; common iron bars, 1.25c; plates and shapes from store, 1.70c to 1.80c. Extras shown under Pittsburgh report.

Old Material.—Holders of old material are evidently satisfied that the market presents little prospect of advance in the near future, as they are realizing on a considerable quantity of scrap. The individual tonnages are small, but, in the aggregate, the movement is fair. Consumers are closing practically only in small lots and are getting material at their own ideas of price, which are on a descending scale. For heavy melting steel, $12, delivered in eastern Pennsylvania, represents the maximum level consumers will pay. We quote, gross tons, prices New York dealers will pay at tidewater, with the exception of cast scrap, which has a local demand, as follows:

Old car wheels	$ 9.75 to 10.00
Old iron axles	18.00 to 18.50
Old steel shafting	14.50 to 15.00
No. 1 heavy melting steel	9.75 to 10.00
No. 1 R. R. wrought	11.50 to 12.00
Iron track scrap	11.00 to 11.50
Wrought pipe	9.00 to 9.25
Cast borings	5.75 to 6.25
Heavy melting cast	11.50 to 12.00
Railroad malleable	9.00 to 9.50
Stove plate	8.00 to 8.25
Grate bars	7.00 to 7.25

Freight rates on scrap per ton to Steelton, Pa., Columbia, Pa., Pottsville, Pa., and Harrisburg, Pa., are $1.50 from Jersey City and $2.00 from New York; to Coatesville, Pa., Ivy Rock, Pa., Phoenixville, Pa., and Reading, Pa., $1.50 from Jersey City and $1.80 from New York; to Bethlehem, Pa., $1.10 from Jersey City and $1.60 from New York, and to Roebling, N. J., $1.00 from Jersey City and $1.50 from New York.

The Southwestern Construction Iron & Steel Mfg. Co., Des Moines, Ia., has amended its articles of incorporation, changing its name to the Northwestern Stamping Co.

CLEVELAND

Ore Movement Keeps Up—Low Bar Price Appears.

Office of THE IRON TRADE REVIEW,
Penton Building, Oct. 17.

Iron Ore.—The Pittsburgh Steamship Co. is shipping its full quota of ore and the movement of the independents is kept up pretty well. It is probable that the movement will be equal to that of October of last year, which was 4,877,000 tons.

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $4.50; Mesabi Bessemer, $4.25; old range non-Bessemer, $3.70; Mesabi non-Bessemer, $3.50.

Pig Iron.—Extreme quiet continues and no sales of importance are reported. Inquiries are also few. Prices show no change. We quote, delivered in Cleveland, for the remainder of the year, as follows:

No. 1 foundry	$14.25
No. 2 foundry	13.75
No. 2 southern	14.35
Gray forge	13.00
Bessemer	15.90
Lake Superior charcoal	17.50
Jackson Co. 8 per cent silvery	17.50

Coke.—The principal sale of the week was from 25 to 30 carloads of foundry coke, but sales now seldom amount to more than a carload or two. We quote:

Connellsville furnace coke, $1.50 to $1.55 for prompt delivery, and $1.60 to $1.70 for second half; Connellsville foundry coke, $1.85 to $1.95 for prompt, and $2 to $2.40 for second half.

Finished Material.—Business is at low ebb and prices are very irregular. While on shapes and plates the low quotations made in the Philadelphia district have not been named here, 1.10c, Pittsburgh, is being done on bars for less than carload lots, if the specifications are fairly satisfactory. Agricultural interests having contracts at higher prices than now prevail are demanding that their contracts be revised and they say that this has been done in some cases. Negotiations are pending for the purchase of 5,000 tons of sheet bars. In spite of the dullness in bar iron, the Cleveland mills have kept fairly active and are taking considerable scrap.

Old Material.—More cheerfulness is noted in the local situation, although it has not been made apparent in price changes or in a larger volume of business booked. However, consumers are showing more disposition actually to close for talk of lower prices has eased off. Local users of heavy steel are actively seeking to cover at $11 for prompt material, but sellers are not anxious to close at this figure. Rolling mills are taking offerings of prompt turnings and busheling. Railroads were not able to secure prices looked for on their lists closed last week, and much of the material was withdrawn. We quote, gross tons, f. o. b. Cleveland, as follows:

Old iron rails	$14.00 to 14.50
Old steel rails (under 6 ft.)	12.00 to 13.00
Old steel rails (over 6 ft.)	12.00 to 12.50
Relaying rails	20.00 to 21.00
Old car wheels	12.00 to 12.50
Old steel boiler plate	9.50 to 10.00
Malleable iron (railroad)	11.50 to 12.00
Steel axles	18.00 to 18.50
Axle turnings	8.50 to 9.00
Malleable iron (agricultural)	10.75 to 11.25
Heavy steel	11.00 to 11.50
Country mixed steel	9.00 to 9.50

We quote, net tons, as follows:

No. 1 R. R. wrought	$11.00 to 11.50
No. 1 busheling	9.00 to 9.50
No. 1 machine cast	11.00 to 11.50
No. 1 dealers' wrought	10.00 to 10.50
Machine shop turnings	6.75 to 7.00
Pipes and flues	8.00 to 8.50
Wrought drillings	6.75 to 7.00
Stove plate	9.00 to 9.50
Cast borings	6.00 to 6.50
Wrought iron piling plate	15.00 to 15.50
Wrought iron arch bars	15.50 to 16.00

ST. LOUIS

Some Fair Structural Prospects—Pig Iron is Quiet.

Oct. 16.

Pig Iron.—The inquiry for 600 tons of No. 2 soft, on the market for a week, is yet unfilled. A report is being circulated that 1,000 tons of southern foundry iron is inquired for, but this cannot be confirmed. Southern No. 2 is still quoted at $10.50, Birmingham, and northern is unchanged at $13.50, Ironton. Prices for southern iron, delivered, to which the Birmingham freight of $3.75 has been added, follow:

Southern No. 1	$14.25 to 14.75
Southern No. 2	13.75 to 14.25
Southern No. 3	13.50 to 14.00
Southern No. 4	13.25 to 13.75

Coke.—Inquiry has been light for the last week, only for small tonnages, and little business of size is in sight today. Prices are unchanged as follows:

We quote 72-hour Connellsville foundry grades, $1.90 to $2.40 for whole of 1911; 72-hour foundry, $1.90 to $2.15 on tracks and for immediate delivery; 48-hour Connellsville furnace, $1.40 to $1.50; best 72-hour Virginia foundry, $2 to $2.25; 48-hour Virginia furnace, $1.60 to $1.85. The freight to East St. Louis and St. Louis is $2.80, and $2.70 from the Virginia fields when shipment is destined beyond St. Louis.

Finished Material.—Orders were fair last week for structural material, all for quick shipment against specifications. Several office buildings, each of which would require a fair tonnage of structural steel, are in contemplation, but that is about as far as they have gotten. Rumors were afloat today that the 22-story Barr building, to occupy an entire city block, would be started by Jan. 1, and the work of clearing the site for a 10-story building to be erected and occupied by the Laclede Gas Light Co., at Tenth and Olive street, has been begun. The building will be of steel frame. Standard rails are in very little demand. A fair tonnage of track fastenings was purchased last week, but the market is bare of inquiry today. Light rails were in somewhat better demand from the coal interests. Orders for bars were for small lots and for quick shipment.

Old Material.—Another slight decline in some items was registered last week, and the market today shows no signs of improvement. Very little business was transacted. Prices are as follows:

Old car wheels	$12.50 to 13.00
Old iron rails	13.00 to 13.50
Rerolling rails (4 ft. and over)	12.00 to 12.25
Old steel rails (2 ft. and under)	10.50 to 11.00
Light section relayers, 45 lbs. and under, subject to inspection	19.00 to 21.00
Relaying rails, subject to inspection	23.00 to 23.50
Frogs, switches and guards	10.00 to 11.00
Heavy melting steel	10.50 to 11.00
Shoveling steel	10.00 to 10.50

We quote, net tons, as follows:

No. 1 R. R. wrought	$10.00 to 10.50
No. 2 R. R. wrought	9.00 to 9.50
Arch bars and transoms	13.00 to 13.50
Knuckles, couplers and springs	9.50 to 10.00
Shafting	13.00 to 13.50
Iron car axles	18.00 to 18.50
Steel car axles	16.00 to 16.50
Locomotive tires	14.00 to 14.50
No. 1 country wrought	8.50 to 9.00
Pipes and flues	7.25 to 7.75
Tank iron and cut boilers	6.75 to 7.25
No. 1 busheling	8.50 to 9.00
No. 2 busheling	5.75 to 6.25
Cast and mixed borings	5.25 to 5.75
Machine shop turnings	6.50 to 7.00
Railroad malleable	9.00 to 9.50
Agricultural malleable	8.00 to 8.50
Stove plate	8.50 to 9.00
Angle splice bars, iron	10.50 to 11.00
Angle splice bars, steel	10.00 to 10.50

BRITISH IRON MARKET

Pig Iron Somewhat Firmer and Finished Conditions Promising.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Oct. 7.

Pig Iron.—The market is in a slightly firmer condition than a week ago. Middlesboro has experienced a substantial reduction of stocks on two days—a rare experience. The combined reduction was considerably over 3,000 tons, and the amount now in store is reduced to 591,000 tons, or 10,000 tons below the maximum of Aug. 19. The remarkable feature is

that while there is a heavy consumption of iron everywhere, prices do not improve. Warrants are now 46s 4d ($11.34) per ton with makers' prices for No. 3, 46s 9d ($11.44). There are very few stocks in makers' hands, and books are well furnished with orders. This suggests that any change will be in an upward direction. It is remarkable that in Cleveland, the men had a 2 per cent reduction in wages, in consequence of lower selling prices. In a busy state of trade, such an occurrence is probably without precedent. Makers of east coast hematite are in a rather better position. Quotations are well maintained at 61s ($14.92) although the market is affected a little by the sale of some second hands.

Finished Iron and Steel.—The most determined efforts to bear the iron market have proved wholly ineffectual. Every department is gaining strength, and bars are taking a clear lead. The South Yorkshire Bar Association has advanced the standard 5s per ton, making the price £7. A good business is being done in galvanized sheets, but prices varying from £11 5s to £11 10s are barely profitable, with spelter at the present high price. The steel trade continues very active. It is remarkable how little the European disturbance is affecting trade. Works employed on shipbuilding material are turning out large quantities of steel and this activity looks like increasing in the near future. At Sheffield, work is increasing in the railway departments, and wagon builders are booked for a long period ahead. Makers of tool steels are having a very busy time, orders coming in increasing quantities from foreign and colonial sources. The great armament works are full of orders, both on home and foreign account. With prices for crude steel rising on the continent, there is increasing indisposition to cultivate British orders, which in any case can only realize the barest margin of profit; new business has therefore been directed wholesale to the great British steel works. Tin plates continue somewhat quiet in regard to new orders, but prices are firm, and the mills are still well employed.

The Rochester Stamping Co., Rochester, N. Y., advises that it is erecting a four-story addition to its Jones street plant. The building will be used for storage purposes and to provide more manufacturing space. No power plant or other machinery will be purchased.

METAL MARKETS

New York

Oct. 17.

Tin.—The London market declined to £183 the early part of last week, and a fair volume of buying by domestic consumers and local dealers was stimulated by the lower prices. Sales were made as low as 40.50c. On Monday, however, foreign quotations were cabled at advances of about £6 from the previous closing, and buyers' enthusiasm suffered a decided check. The cable news also included an announcement that the London metal exchange had passed a resolution to adopt a new standard tin contract that will make brands of tin other than Straits, Banca and Australian, deliverable in settlements beginning Nov. 1. That further encouraged hesitancy, to see what the effect on prices will be. Spot tin is quoted at 41.25c-41.50c, and October and November at 41.15c-41.40c, respectively, today. Arrivals since Oct. 1 aggregate 1,328 tons, and there are 1,458 tons afloat. The London market closed at £188 12s 6d for spot and £188 for three months.

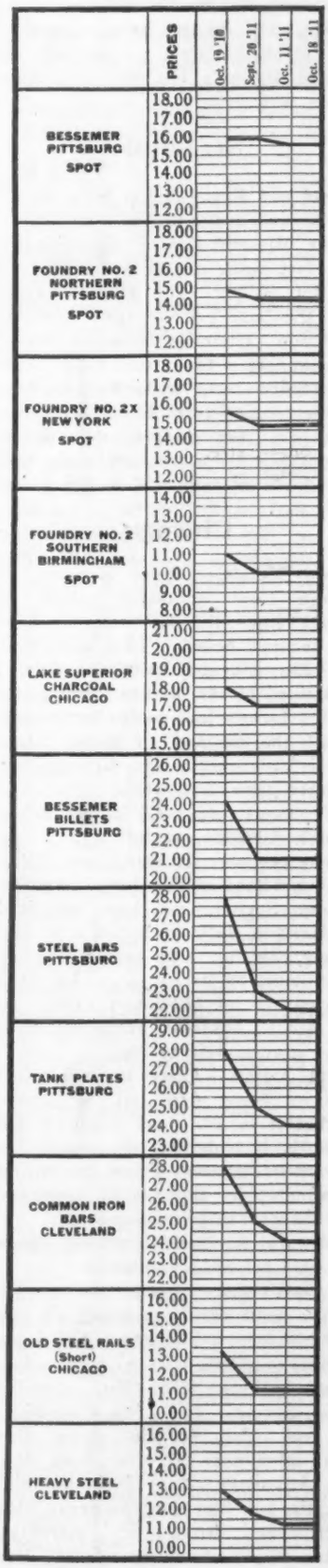
Copper.—A large volume of buying is reported to have been done yesterday, and prices have advanced from 10 to 12½ points above the close of last week. The leading producers are asking 12.37½c, cash New York, and 12.50c, delivered 30 days, for electrolytic, and from 12.50c to 12.62½c for lake. The advance has prompted the charge of manipulation by the important sellers, but while there seems to be no legitimate trade condition that justifies higher prices at present, investigation has not supplied substantiation of the charge. To the contrary, reports from the trade warrant belief that at least a large part of the business was legitimate buying by consumers.

Improvement in London standard prices followed the announcement of the favorable European fortnightly statistics, which showed a decrease in stocks of 2,020 tons and in visible of 2,920 tons, for the first half of October. Spot closed at £55 and three months at £55 16s 3d, today. Exports of copper since Oct. 1 are 9,619 tons.

Lead.—A good demand came out following the reduction in price to 4.25c in New York, and it is reported that consumers have added liberally to stocks. All interests are offering on that basis in the local market.

Spelter.—The market is freely supplied with inquiries as the result of

PRICE CHART



the advance, and what appears to be a scarcity of stocks in producers' hands. Prime western is held at 6.25c in New York for prompt shipments.

Antimony.—There is no life to the market, and prices have sagged a few points further. Cookson's is 8.12½c; Hallett's is 7.60c, and Hungarian is 6.95c.

St. Louis

Oct. 16.

Lead and Zinc.—A top price of $47 a ton was realized for zinc blende in the Missouri-Kansas-Oklahoma district last week on an assay base of $44 for 60 per cent grades. From this, the base price ranged down to $44 a ton. Calamine remained strong, commanding a top price of $32 a ton for choice lots, with 40 per cent grades ranging from $23 to $25 a ton. Lead ore was weaker, the highest price being $57 a ton, while the bulk of the ore brought $54 to $55 a ton.

Chicago

Oct. 16.

New Metals.—Copper is weak, although local quotations show no change since the last report. Lead has declined heavily and is now quoted 4.20c, Chicago, in 50-ton lots, a reduction of $4 a ton during the week. Lower lead prices have stimulated the demand to some extent. Tin is still quoted 41c, Chicago, unchanged from last week.

We quote, dealers' selling prices, f. o. b. Chicago, as follows:

Lake copper, carload lots, 12¾c; casting, 12½c; smaller lots, ¼c to ⅜c higher. Spelter, car lots, 6c; lead, desilverized, 4.20c in 50-ton lots; corroding, 25c per 100 pounds higher; sheet zinc, $8 list, f. o. b. La Salle, in car lots of 600-pound casks; pig tin, 41c. Cookson's antimony, 9¼c; other grades, 8¼c to 8¾c.

Old Metals.—There is some business in copper wire, but the general market is in a listless condition and there is considerable discrepancy in current quotations. Prices are strongly affected by the special conditions surrounding each transaction.

We quote, dealers' selling prices, f. o. b Chicago, as follows:

Copper wire, crucible shapes, 11c; copper bottoms, 9½c; heavy cut and crucible copper, 12c; heavy red brass, 10c; heavy yellow brass, 8½c; No. 1 red brass borings, 9½c; No. 1 yellow brass borings, 7½c; brass clippings, 8c; lead, pipe, 4c; zinc scrap, 4¼c; scrap aluminum, 12c; tea lead, 3¾c; No. 1 pewter, 28c; block tin pipe, 37c; tin foil, 33c; linotype dross, 3¼c; electrotype dross, 3c; stereotype plates, 4½c; stereotype dross, 3¼c; prime slab zinc dross, $80 a ton.

LARGEST IN WORLD

Will be Loft Building on Madison Square Garden Site.

Plans have been issued and bids received from contractors for the construction of the combined loft building that is to occupy the present site of Madison Square Garden, New York City, and which when completed will embrace the largest floor area of any commercial building in the world. The new structure in point of size and character of construction will prove a notable successor to the historic and illustrious building which it will supplant. It will be built in four sections, all of which will be 24 stories in height and consisting practically of one giant structure, and in ground area it will occupy a solid block which will be bounded east and west by Madison and Fourth avenues, and north and south by Twenty-sixth and Twenty-seventh streets. The ground dimensions of the building will be 197½ feet in depth by 425 feet in length. The total floor area will be approximately 1,800,000 square feet. In the center will be a large light well and running the length of the structure from Twenty-sixth to Twenty-seventh streets will be a built-over drive. Construction work is to start immediately upon the expiration of present leases and the tearing down of the present garden, Feb. 1, 1912, and the specifications provide that the building shall be completed by Feb. 1, 1913. The new building will not only be, by far, the largest commercial structure in floor area in New York City, but it will be the tallest loft structure in the metropolis. The highest building of this character in New York at present is 22 stories. Estimates as to the steel requirements of the new building vary, but they may be stated as somewhere between 20,000 and 30,000 tons.

Two Plants Combined

The John Wood Iron Works, Portland, Ore., which on Aug. 1 took over the Oregon Foundry, that city, advises that it is constructing a new machine shop in order that the two plants may be concentrated at one point. A general jobbing and contracting business will be carried on. A new department has also been added for manufacturing heavy blocks and tackle.

Locomotive Orders.—Orders for locomotives placed by the railroads show some improvement during the past several weeks and several fair sized contracts of this character have been closed. The New York Central railroad has placed 60 locomotives, dividing the order between the American Locomotive Co. and the Baldwin Locomotive Works. The Buffalo, Rochester & Pittsburgh has placed 25 locomotives with the American Locomotive Co.

Western Steel in Receivers' Hands

The Western Steel Corporation, Seattle, is now in the hands of receivers who will serve until the creditors choose a trustee. Among the petitions which brought about the action was one signed by the Metropolitan Trust Co., of New York City. This stated that that concern had made advances early this year of $600,000 to the Western Steel Corporation and was willing to make further advances if President James A. Moore would retire from control. The Trust company likewise expressed a desire to become enlightened concerning the visible assets of the steel company and also what connection, if any, existed between the latter and the Irondale Realty Co.

Dunn Named Director

Gano Dunn, who for many years was first vice president and chief engineer of the Crocker-Wheeler Co., and who is a past president of the New York Electrical Society, has been elected a director and a vice president of J. G. White & Co., Inc., New York. Mr. Dunn has just returned from abroad, where, as a representative of the United States government, and as president of the American Institute of Electrical Engineers he has been attending the International Electrical Congress, at Turin, and the meeting of the International Electro-Technical Commission.

Chosen President.—Nathaniel Curry, of Montreal, president of the Canadian Car & Foundry Co., was elected president of the Canadian Manufacturers' Association at the annual convention at Toronto, Oct. 10-12. The convention took no official action regarding the tariff, but the general opinion was decidedly favorable to the appointment of a tariff commission.

The Tonawanda Iron & Steel Co., North Tonawanda, N. Y., blew out its B furnace, Oct. 10.

CONTRACTS PLACED

For Crucible Co.'s Reversing Engine for Midland Works.

The Pittsburgh Crucible Steel Co., which is building new steel works at Midland, Pa., consisting of six open-hearth steel furnaces, blooming mill, etc., on the property purchased last spring from the Midland Steel Co., has awarded a contract to Mackintosh, Hemphill & Co., Pittsburgh, for a pair of 44 and 70 x 60-inch twin tandem compound reversing engines for driving the new 40-inch blooming mill. Mackintosh, Hemphill & Co. have also received a contract within the last two weeks for a 55 x 60-inch direct connected twin cylinder reversing engine to drive the blooming mill of the Algoma Steel Co., Saulte Ste Marie.

The engine to be built for the Pittsburgh Crucible Steel Co.'s new plant is similar to those built by Mackintosh, Hemphill & Co. for the Duquesne steel works of the Carnegie Steel Co. and the Aliquippa, Pa. works of the Jones & Laughlin Steel Co. A detail description of the engine installed at the Duquesne steel works was published in a previous issue of THE IRON TRADE REVIEW.

Finished Building

The Alvery-Ferguson Co., manufacturers of power conveying machinery, which recently purchased a factory site in Oakley, near Cincinnati, with the intention of moving to that place from Louisville, Ky., has completed the construction of the main shops together with the building for the housing of the wood-working department and offices. The main factory will have about 700,000 feet of floor space. The officers of the company are: President, M. U. Bernheim; vice president, E. Palmer Bernheim; secretary and treasurer, I. L. Bertzfelder.

Inspecting Mines

A party including President E. A. S. Clarke, of the Lackawanna Steel Co.; President James A. Campbell, of the Youngstown Sheet & Tube Co.; President H. Colby of the Pittsburgh Steamship Co.; H. G. Dalton and Samuel Mather, both of Cleveland, has been spending some days on an inspection tour of the Lake Superior iron ore regions.

New Cincinnati Building. — The Union Central Life Insurance Co. will erect a 27-story office structure on the site of the Chamber of Commerce building which recently was burned. Cass Gilbert, architect, New York, is preparing plans. The tonnage will be between 3,000 and 4,000.

Will Offer Its Plant for Sale

The Macomber & Whyte Rope Co., 507 South Clinton street, Chicago, which is about to abandon its old plant at Coal City, Ill., announces that it will offer the plant either for sale or for rent. The buildings are all of brick, one story, and are connected, occupying a space, 160 x 360 feet. Included is a 175-horsepower steam power plant, complete with boilers, and also a 110-kilowatt, 220-volt, 60-cycle, alternating current generator electric light plant. The plant has a water supply and is connected as well to the city mains. It is also provided with a connection with the local power plant. Coal City is 63 miles from Chicago on the Atcheson, Topeka & Santa Fe, the Elgin, Joliet & Eastern and the Chicago and Alton railways.

Equipment Contracts Let

The board of public works of San Francisco has let the contract for four 125-kilowatt, 125-250-volt, direct current, three-wire, non-condensing Curtiss General Electric type steam turbo-generating units, and switchboard and cables for the new San Francisco hospital to Frederick C. Roberts & Co., San Francisco, for the sum of $25,198. The contract for two batteries of two 250-horsepower water tube boilers, boiler feed pump, vacuum pump, hot water pump and 12-inch and 6-inch pipe for connections was awarded to the Robert Dalziel Co. for the sum of $52,897.

Robesonia Stack Lighted

The Robesonia Iron Co., Ltd., relighted its blast furnace at Robesonia, Pa., on Oct. 12 and it is now running nicely.

Fire inflicted damage estimated at $60,000 upon the Standard Mfg. Co. and at $25,000 upon the Webster Mfg. Co., when the buildings at 2410 West Fifteenth street, Chicago, were badly damaged, on Oct. 14.

C. A. Fisher, of Canton, O., has been named receiver for the Royal Foundry & Machine Co., of that city, by the federal district court at Cleveland.

NO ORE BY SEA

May be Russian Edict.—Effect of Such a Ruling.

Radical readjustments in the British, German and Austrian iron ore markets pointing toward greatly increased importation of American ore and pig are pending with the fate of a new government measure about to be presented to the duma by the Russian minister of commerce. According to the *Novoye Vremya*, the government proposes to forbid the exportation of iron ore by sea, thus completely confining the smelting of the entire mine output to Russian territory.

The exportation of ore over the western frontier has been prohibited for some time past, and in spite of the active efforts of those controlling the Polish deposits, these regulations continue to be rigidly enforced. England, Germany and Austria are the principal consumers of Russian ore, and their markets would be immediately affected by this summary circumscription of ore supply.

If enacted into law the new prohibition will chiefly affect the Kriowi-Roger and Donetz districts, exports from which pass almost entirely through the port of Nicolaieff. This movement has been steadily increasing during recent years; exports from the Donetz basin amounted to 26.7 million poods for the first five months of 1911, against 24,000,000 for the corresponding period last year, while the Russian furnaces took 97.8 million poods, against 84.5 in 1910. It is officially estimated that the Kriowi-Roger deposits, occurring chiefly along the borders of Ekaterinoslav and Cherson, amount to 5,250,000,000 poods, while the entire Russion deposit totals about 50,000,000,000 poods.

A strong opposition to the measure is said to be organizing among the exporters of Nicolaiff and the Polish ore land holders together with German and other interested foreign elements. It is not believed, however, that there is a sufficiently strong conservation element in the duma to successfully cope with the ministry. Then again, there are three known methods by which the government can pass its own bills, parliament notwithstanding. One of these was made use of in the promulgation of the Polish representation act, by imperial ukase during a recess of the duma, and was the leading cause of the assassination of M. Stolypin.

CARRY BIG STOCKS

Of Steel Products in Remodeled Warehouse at Frisco.

San Francisco, Oct. 14.—Much activity is evident at the old shops of the Risdon Iron Works, where the United States Steel Products Co. is establishing its large distributive warehouse plant for the storage and shipment of the various products of the United States Steel Corporation. Charles J. Daley, of the American Steel & Wire Co., is in charge of the work of reconstruction and has already made much progress.

Aside from the large amount of steel scrap which the Risdon company sold direct, the workmen have gathered between 500 and 1,000 tons of old material which is to be placed on the market as soon as bids can be prepared. A large force of men is installing in the railroad yards an improved switching system, the tracks being depressed so that the cars will be level with the platforms of the buildings. The machine shop is being converted into a warehouse for wire and nails. One gallery has been taken out, the traveling cranes at the sides are to be removed, but the large central crane will be retained. Much material has already been stored in this building. The old boiler shop is being prepared as a warehouse for structural material, where a complete stock of beams, channels and plates will be stored. High-speed Ryerson saws, and Hillis & Jones shears, bulldozers and punches will be installed in this building.

What was formerly the plate shop will be used as storage for rails and reinforcing materials. Square and round bars will comprise the first stocks. More than 500 tons of rails are already on the ground. The old copper shop will be used for track supplies. The pattern shop is being converted into a warehouse for plates and tin plate. But a small section of the present power house will be retained for its present purpose, the balance being used for miscellaneous storage. Wire fencing piled roof high occupies the building which was formerly the forge, and the ship shed is being converted into a warehouse for merchant bars and small angles. A large traveling crane will be used in this building. A new office building, 40 x 50 feet, is being erected at the entrance of the works, and in the rear is a small building, to be used as an emergency hospital. In the yard formerly used by the Pacific Rolling Mills for bar storage, the company is planning to erect a large pipe warehouse.

It is the intention of the company completely to rejuvenate the docks and shipping facilities and an appropriation of $60,000 has been made for this purpose. Thirty feet of water for a distance of 200 feet from the present wharves will afford docking space for all but the very largest vessels, while a complete mono-rail system will make the work of unloading convenient and speedy.

Steel Plant for Detroit

An open-hearth steel plant with an annual capacity of 100,000 tons is to be built in Detroit. C. W. Baird, who was active in promoting the Detroit Iron & Steel Co., has arranged for the underwriting of the bonds, and some of the stock has been sold. The Detroit Iron & Steel Co. has no financial interest in the new enterprise, but it is understood that some of the stockholders will also be stockholders in the new company. The Detroit Iron & Steel Co. will probably make a contract to furnish basic pig iron to the steel plant. Detroit was the original point at which Bessemer was made, but there has been no steel plant in the city for a number of years. Owing to the rapid increase in the manufacturing of automobiles and the development of other industries in the city, Detroit is now believed to be a very favorable place to locate a steel plant and the outlook of the new company is very promising.

Offer to Sell Bonds

The Railway Steel Spring Co. is offering $3,500,000 of first mortgage 5 per cent gold bonds in connection with the recent purchase of the Inter-Ocean Steel Co., of Chicago. These bonds are payable Oct. 1, 1931, or are redeemable at the company's option upon an interest date at 105 and accrued interest.

Stockholders of the Knoxville Iron Co., Knoxville, Tenn., will meet Oct. 26, when the question of removing the plant to some other southern city may be taken up. President T. I. Stephenson declared that the company has been harassed by officials of Lonsdale, where the plant is now located.

The Defiance Pressed Steel Co., Defiance, O., has awarded a contract to Baker Bros., also of Defiance, for an addition to its works, estimated to cost $40,000.

RAISE VALUATION

Of Minnesota Mining Property by Tax Commission.

Ishpeming, Mich., Oct. 16.—The upper Michigan mining companies are not the only operators in the Lake Superior iron ore region confronted with an increase in the assessed valuation of their properties. Approximately $10,000,000, it is understood, will be added to the amount at which the Minnesota iron mines are now on the rolls. The present aggregate valuation of these properties is $221,173,775, compared with the Michigan total of $85,000,000. The Minnesota mining representatives have been given a hearing by the tax commission of that state and the proposed increases are now under consideration.

The mines, the assessments of which are to be boosted, are on the Mesaba range, in St. Louis and Itasca counties, and on the Vermilion range, in St. Louis and Lake counties. While no information has been divulged as to the probable increases in individual cases, it is the understanding they will be based on new developments at the various properties and in no instance will be arbitrary. It was largely to explain present physical conditions that the mining men appeared before the tax commission. The arguments chiefly were technical.

A year ago the Minnesota commission made a sweeping arbitrary raise of 5 per cent on all mining assessments. The plan of increasing the valuations this year is on a different basis. The Minnesota law requires the mining companies to file statements as to the condition of their properties on May 1. The commission verifies the figures and makes its assessments on the basis of its finding.

Boston Warehouse.—The new warehouse at Boston, Mass., in course of erection for the Brown-Wales Co., bar iron and steel, shapes, iron workers', boilermakers' and sheet metal supplies, pipe and fittings, and a complete line of factory and mill supplies, is to be of steel, brick and terra cotta trim, with windows affording an abundance of light to the eight stories. It will cover 13,250 square feet of land, having a frontage on C street of 132.5 feet and on Fargo street of 100 feet. Three freight elevators, located at three platforms, will carry merchandise to the upper floors. The total investment will approximate $250,000 and will afford the company much needed room for its fast-growing business.

CHANNEL BLOCKED

By Sunken Freighter Just Outside Canadian Lock.

One of the most singular accidents that has happened at the Sault occurred to the bulk freighter Emperor on Tuesday in leaving the Canadian lock. The Emperor, which is the largest bulk freighter under Canadian register on the lakes, was bound from Fort William to Midland with a cargo of 310,000 bushels of wheat. Capt. George Pearson of the Emperor had gone ashore to report, leaving the vessel in charge of the first mate. It is the practice at the Canadian lock to flood vessels out, thus giving them the advantage of a little greater draught than is obtainable at the Poe lock, where the practice of flooding is not followed. It is customary for the vessel to indicate her preparedness for the flood by a sharp blast, but in this case Capt. Pearson maintains that the vessel was flooded out before she had a chance to cast off her lines.

She shot out at great speed and the mate dropped an anchor overboard to check her. It is not clear why this maneuver should have been attempted unless it is that he feared colliding with some object, for there is not sufficient water at this point for a vessel to pass over its own anchor. The result was that the anchor tore a hole in the bottom of the Emperor and she settled on the bottom about 400 ft. from the lower approach of the lock with her stern against the north pier and her bow 100 ft. out in the channel. The channel is blocked for the largest class of carriers temporarily. The work of releasing her is being rushed.

St. Louis Shipments

Receipts and shipments of pig lead and spelter at St. Louis for the last two weeks were as follows:

	Zinc and Spelter.	Pigs of lead.
Receipts:		
For week ending Oct. 7....	119,270	43,000
For week ending Oct. 14...	117,460	24,870
Shipments:		
For week ending Oct. 7....	94,070	28,280
For week ending Oct. 14...	101,950	21,690

Seized by Bandits.—Pedro Aguilera, of the Spanish-American Iron Co., and Jennings S. Cox Jr., the company's general manager, were seized on Oct. 13 by a party of bandits near the company's workings in Cuba, and held for a ransom of $2,000. Mr. Cox, who was liberated in order that he might secure the amount, returned later with a party of armed men and in the ensuing fight Aguilera's freedom was obtained. Two of the bandits were later arrested. Both are laborers employed near the El Cuero mines.

Westinghouse Shops for Pacific Coast

San Francisco, Oct. 14.—The Westinghouse Pacific Coast Brake Co. has filed articles of incorporation, naming its capital stock at $100,000. The directors are H. H. Westinghouse, of New York, who is credited with $99,400 worth of stock; A. L. Humphrey, of Wilmerding, Pa.; W. S. Bartholomew, of Chicago; and A. F. Peterson, H. A. Crocker, S. G. Down, and J. C. Campbell, of San Francisco, who are credited with $100 worth of stock each. The company purchased a tract of land at Emeryville, Cal., near Oakland, some time ago. The articles of incorporation describe the business of the firm to carry on the business of manufacturers and dealers in air or pneumatic brakes, and braking devices and appliances of every description; to manufacture, buy, sell, export, import and generally deal in air or pneumatic devices, etc.

Works Additions Being Undertaken

Toronto, Can., Oct. 17.—The Russell Motor Car Co. will proceed at once with the building of an addition to its plant in West Toronto, to cost $30,000. It will be of modern construction throughout and furnished with the latest equipment. The work will be pushed rapidly so as to get the building roofed before winter.

The Jules Motor Co., which has just completed its plant at Guelph, began active operations last week, having already orders in hand for 300 autos, including an order for 100 from Winnipeg.

The Winnipeg board of control asks for tenders to be received up to Nov. 3 for the delivery of incandescent carbon and tungsten filament lamps for the civic lighting and power system.

Good Bar Iron Order

Reading, Pa., Oct. 16.—The Reading Iron Co. has received orders for bar iron from the Reading and the Baltimore & Ohio railroad companies aggregating about 1,000 tons. This was one of the best bar iron orders received in this city for some time. It will be made largely at the Danville plant of the company.

NEW SHEET MILL

To Be Operated at South Louisville, Ky.—Old Plant Remodeled.

The Louisville Steel & Iron Co. is to be incorporated shortly with a capitalization of $400,000 in Indianapolis, for the purpose of starting a bar-iron mill and steel sheet works in South Louisville, Ky. The company is being promoted by George H. Holzbog, of Jeffersonville, Ind., who secured the old plant and equipment of the Louisville Bolt & Iron Works, on Jones street in South Louisville, when that concern went out of business eight years ago. The plant will be rebuilt from top to bottom and equipped to produce 25,000 tons of steel sheets per year, employing about 300 men. It is proposed to make the concern capable of handling $1,000,000 worth of business a year.

Plan Large Installation of Turbine Blowers

Contracts have been placed with the General Electric Co. by the Tennessee Coal, Iron & Railroad Co. for the installation at Corey, Ala., of the largest installation of turbine-driven centrifugal blowers that has yet been made in this country. The installation will consist of nine separate units all of large and varied capacities and it will represent the entire equipment of this character required for the large by-product coke plant being constructed by the Tennessee company at Corey. The blowers will all be of larger capacity than those now in use at several blast furnaces of this country. The building of this equipment in the shops of the General Electric Co. is now nearing completion and shipments will go forward shortly. The three centrifugal blowers installed at the new blast furnace plant of the Iroquois Iron Co., Chicago, will be placed in operation in about a month.

Lockout Ended.—The lockout of 1,500 structural iron workers by the Allied Iron Trades of New York City, which began Oct. 6, was ended by the executive committee of the organization, Oct. 16. The order provided that if the seven buildings on which the iron workers were on strike were not manned by Oct. 13, the lockout would be made complete and would continue until a full quota of men were engaged on these contracts. Some of the iron workers returned to work last Friday, and it is now announced that the seven buildings are fully manned.

Record Production

Of Tin Plate Predicted—Convention Hall Contract Let.

New York, Oct. 18. (By wire.)—Leading tin plate makers are predicting that the present year's production of this material in the United States will break all past records.

Railroads continue to indicate that they will make important purchases of equipment in the near future, but developments are slow. The Baltimore & Ohio is reported to have prepared specifications for 5,000 cars and the Pennsylvania is also credited with large prospective orders. The Pennsylvania has placed a number of steel coaches, of which 52 are understood to have gone to the Pressed Steel Car Co., and 30 to 40 divided between the American Car & Foundry Co. and the Standard Steel Car Co. The Buffalo, Rochester & Pittsburgh has issued revised specifications for 1,086 steel underframes. Rail sales are small, the Corporation's mills reporting but 3,000 tons in the week. The inquiry from the Canadian Pacific for 50,000 tons is still pending.

The Chas. McCaul Co. has been awarded the general contract for the Philadelphia convention hall, which will require 12,000 tons of steel.

Inquiries for Malleable

Pittsburgh, Oct. 18. (By wire.)—A few written inquiries involving from 1,000 to 1,500 tons each of malleable pig iron for first half delivery, have been put out. Some of these inquiries cover only part of the requirements for that period and likely were put out with a view of testing the market. The most encouraging feature of the pig iron market is that consumers are accepting heavy shipments and furnace stocks show a big reduction as compared with 60 days ago.

Personal

Lee C. Moore, of Lee C. Moore & Co., Pittsburgh, is spending a few weeks along the Pacific coast.

W. P. Snyder, president of the Shenango Furnace Co., Pittsburgh, returned Monday, Oct. 16, from a two months' trip to Europe.

Leonard Peckitt, president of the Empire Steel & Iron Co., Catasauqua, Pa., has returned from a several weeks' trip to Pacific coast points.

B. Hochschild was elected president and J. Langeloth chairman of the American Metal Co., Ltd., New York City, at the recent annual meeting.

Albert H. Wiggin, president of the Chase International Bank of New York, was elected a director at the annual meeting of the American Locomotive Co., to succeed the late Julius E. French.

James T. Lee, formerly connected with the Hanna Engineering Works, Chicago, has been appointed Chicago representative of the Mumford Molding Machine Co., Plainfield, N. J. Mr. Lee's address is 2059 Elston avenue.

C. R. Vincent, president of the Ball & Wood Co. for many years, has been appointed manager of the Monel metal department of the Ruggles-Coles Engineering Co., 50 Church street, New York City. This metal is manufactured by the Bayonne Casting Co., Bayonne, N. J.

Edward B. Cook, of the Warwick Iron & Steel Co., Pottstown, Pa., has gone abroad and before returning will visit some of the Spanish mines which are shipping iron ore to this country. Mr. Cook accompanied S. G. Harrison, of the Spanish ore firm of Sota Aznar, who is returning to London after a business trip to this country.

Harry S. Brady, formerly connected with the Youghiogheny & Ohio Coal Co. interests at Cleveland, and the Pittsburgh Plate Glass Co.'s coal interests, has become associated with the Cleveland office of the Moreland Coal Co., of Pittsburgh, where, together with W. J. Houston, he will have charge of the Moreland company's interests at that point.

Obituary

Caleb Morris Peelle, president of the Peelle Elevator Gate Mfg. Co., died at his home in Brooklyn, Oct. 11.

Thomas Neely, secretary and treasurer of the Neely Nut & Bolt Co., Southside, Pittsburgh, died unexpectedly at his home in Pittsburgh, Oct. 11. Mr. Neely has been identified with the iron trade practically all his life, having formed at an early age the partnership of Marland, Neely & Co., to manufacture nuts and bolts. About 10 years ago the firm name was changed to the Neely Nut & Bolt Co., of which Mr. Neely was made secretary and treasurer. He was a brother of the late John Neely, formerly assistant secretary and treasurer of the Crucible Steel Co. of America.

John McLaren, aged 61, president of the Phillips & McLaren Co., with works at Twenty-third and Smallman streets, Pittsburgh, died suddenly of heart failure, Saturday, Oct. 14, at the Pennsylvania railroad station, Braddock, Pa. Mr. McLaren was returning from a business trip to Morgantown, W. Va., and was waiting at the Pennsylvania station for a train to take him to Pittsburgh when heart failure seized him. Up until the time he left Morgantown, Mr. McLaren had been in good health. Mr. McLaren was born in New York City. He moved to Pittsburgh at an early age and had been a resident of that city for 45 years. He became identified with several Pittsburgh concerns engaged in the foundry and machinery business and a number of years ago engaged in business for himself.

Col. William Mather Bolles, aged 84, a pioneer pig iron manufacturer, of southern Ohio, died at the home of his sister in Portsmouth, O., Oct. 7. Death was due to the infirmities of old age. Col. Bolles first entered the iron business in 1851, when he went to Ironton and was engaged as bookkeeper in the offices of Campbell, Peters & Co., which operated charcoal furnaces. Later on he became a partner in the firm and also in the Washington and Monroe furnaces in Lawrence and Jackson counties. The companies controling these furnaces were united in 1867 under the name of the Union Iron Co., and Col. Bolles still remained a partner until 1883. During recent years he had been employed until the time of his death in the offices of Hutchins & Hamm, on Chillicothe street, Portsmouth.

Augustine R. Treadway, aged 76, died at his residence, 2175 West Fourteeth street, Cleveland, Oct. 16, death being due to weakness of the heart. Mr. Treadway was one of the pioneers in the iron trade in and around Cleveland, having gone to that city from Southington, Conn., in 1879, where he organized the Wilcox-Treadway Co., manufacturers of hardware. This company, together with several similar concerns, were later merged into the Peck, Stow & Wilcox Co., and Mr. Treadway was made vice president, until 15 years ago, when he was elected president, which position he held until recently, poor health causing his retirement. He was intimately connected with practically all of the men who have developed the iron industry in Cleveland. Beside his connection with the Peck, Stow & Wilcox Co., Mr. Treadway was a director of the Union Rolling Mill Co., Cleveland.

The United States Assay & Refining Co., St. Louis, has applied for a Missouri charter to do business in refining ores and mineral products. The capital stock is $7,000.

The Lighting of Modern Machine Tool Plants

Remarkable Night Views of Cincinnati Shops Which Show the Efficiency of the Artificial Lighting System

By Geo. W. Walker

The essential requirements for a factory manufacturing a finished product are efficiency, accuracy and economical production. In order to obtain these important requirements, the operating conditions must be such that the production is maintained at its maximum during the entire length of the working hours, and the output and efficiency of the employes does not decrease during the dark hours when it is necessary to work by artificial light. Those familiar with factory conditions know how great is the tendency for the load factor to fall off and production to slacken as the dark hours approach, unless the artificial illumination approximates daylight, especially in modern industrial plants so well provided with natural daylight.

Since machine tools are the machines by means of which other important mechanical operations are performed, they must be accurately constructed. In order that this is accomplished, a good natural and artificial light is required. The lighting layout and artificial illumination should be such as to prevent glare or the direct exposure of the eyes to sources of light of high intrinsic brilliancy. The quality of the light should be easy and agreeable to the eyes. The effective illumination in the working sections should be of the required intensity for the class of work done, and the distribution such that nearly a uniform intensity is obtained and shadows are practically eliminated. This can be obtained by the so-called overhead illumination with the proper lamps, producing sufficient effective illumination for practically all classes of outside work. The conditions by artificial light should approximate those by daylight. This requirement can be obtained by a systematic layout with Cooper Hewitt lamps because of the tube light and the absence of glare due to the very low intrinsic brilliancy.

Visual Acuity Tests.

Louis Bell, Ph. D., eminent consulting and illuminating engineer, also past president and vice president of the Illuminating Engineering Society, with the assistance of Dr. Charles H. Williams, the eminent oculist, and three other qualified assistants, recently made extensive and impartial visual acuity tests with different illuminants. From the results of these tests it was proven that the more nearly monochromatic the light, meaning the more nearly the illuminant consists of one color or presenting rays of light of one color only in the spectrum, the greater will be the acuity of vision for an actual, equal photometric candlepower.

A machine shop or factory requires a good, general, well-distributed and effective illumination in order to prevent accidents. Vast sums are expended every year because of unguarded machinery and badly lighted shops. With a lighting system giving practically a uniform intensity, it is perfectly feasible to eliminate accidents due to lack of light in shops. This should be done for the benefit of the employes and to prevent the possibility of damage suits and labor troubles. Statistics show that a maximum of accidents occur toward the close and beginning of each year, that is, during November, December and January, the months of minimum daylight.

Machine tool shops especially, and a great many other factories use the various kinds of machine tools in performing the necessary operations. With the low, spotted, individual system of lighting on the cutting point of tools and sometimes for bench, vise and some other classes of work, the intensity of light is frequently far above the actual requirements and a source of much physical discomfort, while around the operative a semi-darkness prevails which has a blinding effect in the sudden transitions of the vision required by his employment. It has been found by exact photometric observations of shop lighting conditions, both during the day and at night, that

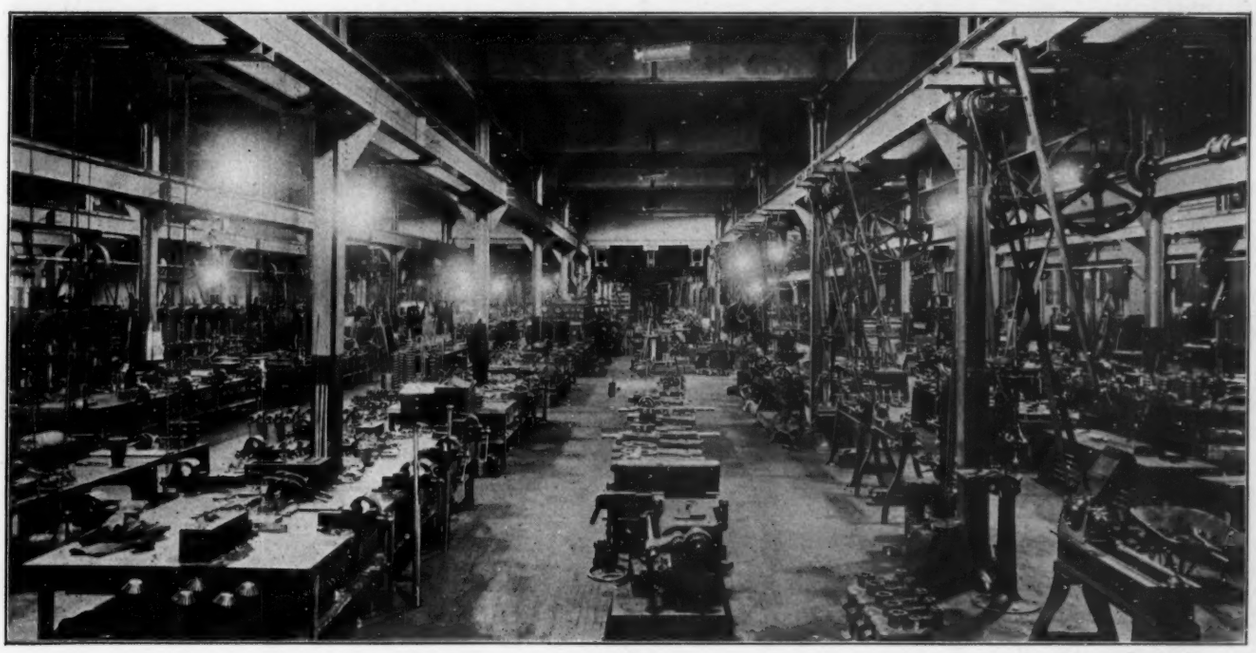


FIG. 1—A NIGHT VIEW OF THE CINCINNATI BICKFORD TOOL CO.'S SHOP, SHOWING ARTIFICIAL ILLUMINATION

FIG. 2—A NIGHT VIEW OF ONE OF THE CINCINNATI MILLING MACHINE CO.'S DEPARTMENTS, SHOWING ARTIFICIAL ILLUMINATION

the concentrated illumination on cutting tools in machines and the area near them is often several times the intensity of ordinary daylight on the same parts. It is very difficult to convince the operative that he is suffering from too much light at any place and the call is constantly for more light. This excessive hard light on spots only, which causes eyestrain and poor vision of surrounding areas with resultant accident, can be eliminated with a good, well-diffused, overhead lighting system.

It is claimed that in Cincinnati and its suburbs, more machine tools are made than in any other city in the world, and about 15,000 men are employed in these plants. In the manufacture of upright and radial drills by the Cincinnati Bickford Tool Co.; milling machines and universal grinders by the Cincinnati Milling Machine Co.; planers and boring mills by the Cincinnati Planer Co.; lathes, milling machines and cutter grinders by the R. K. LeBlond Machine Tool Co., and portable electric drills and grinders by the Hisey-Wolf Machine Co., practically all the different kinds of machine tools are covered except some of the special and automatic tools. These Cincinnati machine tool builders have new, modern, and in every respect up-to-date works, and all are lighted with complete installations of Cooper Hewitt lamps. In these works very few individual lamps are used, and about the only ones required are those on machines, where it is necessary to see into, under, or inside of work being done. In all of these works the Cooper Hewitt lamp layout was made according to the machinery layout and class of work done in each section.

FIG. 3—A NIGHT VIEW OF ANOTHER DEPARTMENT OF THE CINCINNATI MILLING MACHINE CO., SHOWING ARTIFICIAL ILLUMINATION

FIG. 4—A NIGHT VIEW OF THE CINCINNATI PLANER CO.'S SHOP, SHOWING ARTIFICIAL ILLUMINATION

There is no set rule as to the size of lamp and number of square feet of floor space lighted per lamp, as this will depend upon the intensity required, height of suspension, obstruction, etc. The accompanying illustrations are from photographs taken at night on short exposure purely by the illumination from the lamps and they have not been retouched.

Fig. 1 is an illustration from a night photograph of the interior of the Cincinnati Bickford Tool Co.'s shop, and Fig. 6 is the floor plan, showing the lighting layout. The Cooper Hewitt installation consists of 50 type H, and 41 type HH lamps. The average height of suspension of the large size, type HH lamps is from 16 to 24 feet above the floor, and the average height of the small size type H lamps is about 12 feet above the floor. The lamps are all operated on a normal supply voltage of 220 volts direct current at the terminals of the lamps. The total consumption is 25.4 kilowatts and the average is 0.36 watts per square foot, or 2.8 square feet per watt.

Cincinnati Milling Machine Co.

In Figs. 2 and 3 are shown two night views of the interior of the shop of the Cincinnati Milling Machine Co., taken from different positions, and Fig. 7 is the floor plan, showing the lighting layout. The Cooper Hewitt installation consists of 90 type HH, and 24 type H lamps. The height of suspension of the lamps in the large crane aisle is 24 feet above the floor and in the remainder of the shop, 16 feet above the floor. The lamps are all operated on a normal supply voltage of 220 volts direct current at the terminals of the lamps. The total consumption is 39.3 kilowatts, and the average is 0.41 watts per square foot, or 2.24 square feet per watt. This firm has also nearly completed and equipped, in addition to the floor plan shown, an extension to its new works,

FIG. 5—A NIGHT VIEW OF THE HISEY-WOLFF MACHINE CO.'S SHOP, SHOWING ARTIFICIAL ILLUMINATION

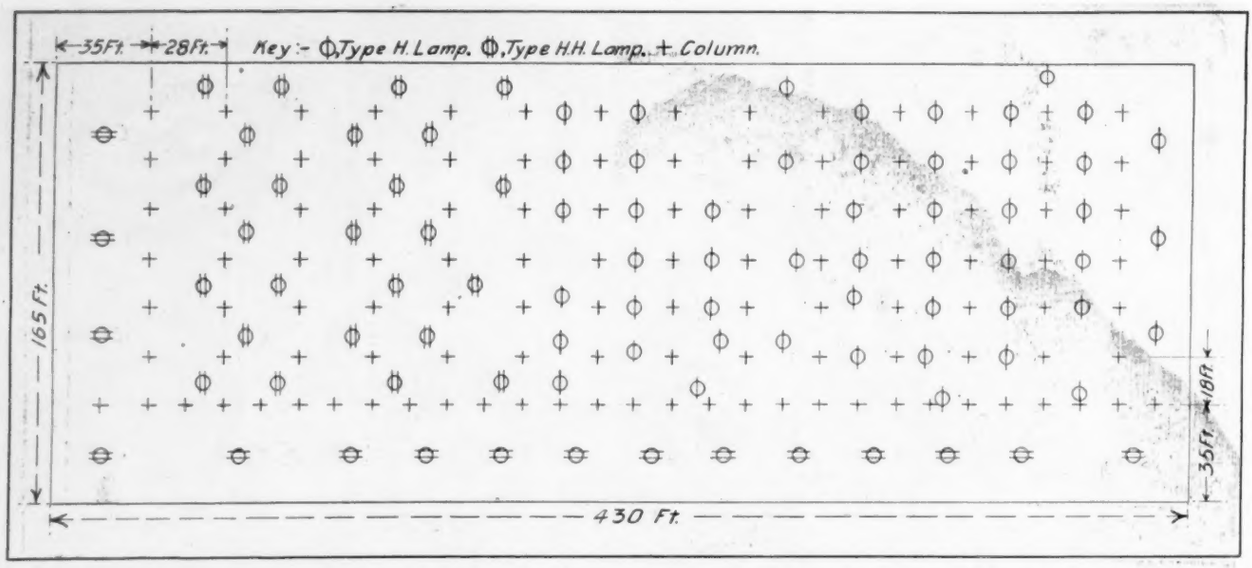


FIG. 6—FLOOR PLAN OF THE CINCINNATI BICKFORD TOOL CO.'S SHOP, SHOWING THE COOPER HEWITT LAMP LAYOUT

consisting of about 85,000 square feet of floor space, and has purchased 78 type HH Cooper Hewitt lamps to light the new extension.

Fig. 4 is a night view of the interior of the Cincinnati Planer Co.'s shop, and Fig. 8 is the floor plan, showing the lighting layout. The Cooper Hewitt installation in the machine shop consists of 52 type H, and 28 type HH lamps, and the draughting room is lighted with four type H lamps. In the center aisle of the machine shop the height of suspension of the lamps is 28 feet above the floor and in the two side aisles the average height of suspension is about 12 feet above the floor. The lamps are all operated on a normal supply voltage of 220 volts, direct current at the terminals of the lamps. The total consumption is 20.8 kilowatts, and the average is 0.38 watts per square foot, or 2.63 square feet per watt.

R. K. LeBlond Machine Tool Co.

The R. K. LeBlond Machine Tool Co. has one of the most modern and one of the best equipped machine tool plants in the Cincinnati district. As the buildings are not all under one roof, no night photographs could be obtained which would give a good, general idea of the size of the works and do them justice. For this reason it is also practically impossible to show a floor plan giving the lighting layout for the different sections and floors. However, this firm has installed and purchased 52 type P, 64 type H and five type K Cooper Hewitt lamps, a total of 121. The draughting room is lighted with eight type H lamps. The lighting circuit is the three-wire system and the lamps are all operated on a normal voltage of 110 volts, direct current at the terminals of the lamps. The total consumption is 33.5 kilowatts and the approximate average in the different sections is 0.4 watts per square foot, or 2.5 square feet per watt.

Fig. 5 shows a night view of the first floor of the Hisey-Wolf Machine Co.'s shops. The factory is housed in a two-story building with approximately the same square feet of manufacturing floor space on each floor. The

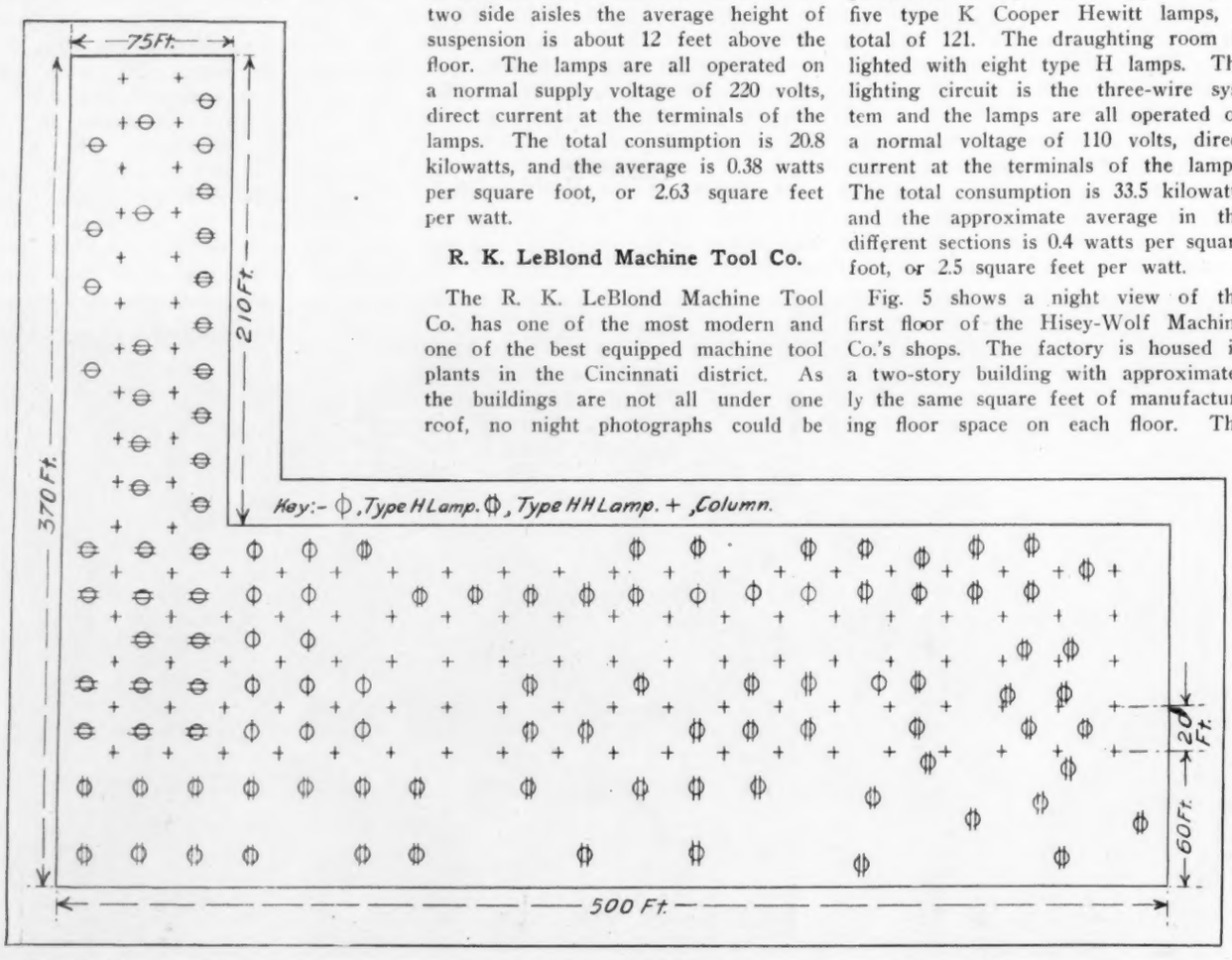


FIG. 7—FLOOR PLAN OF THE CINCINNATI MILLING MACHINE CO.'S SHOP, SHOWING THE COOPER HEWITT LAMP LAYOUT

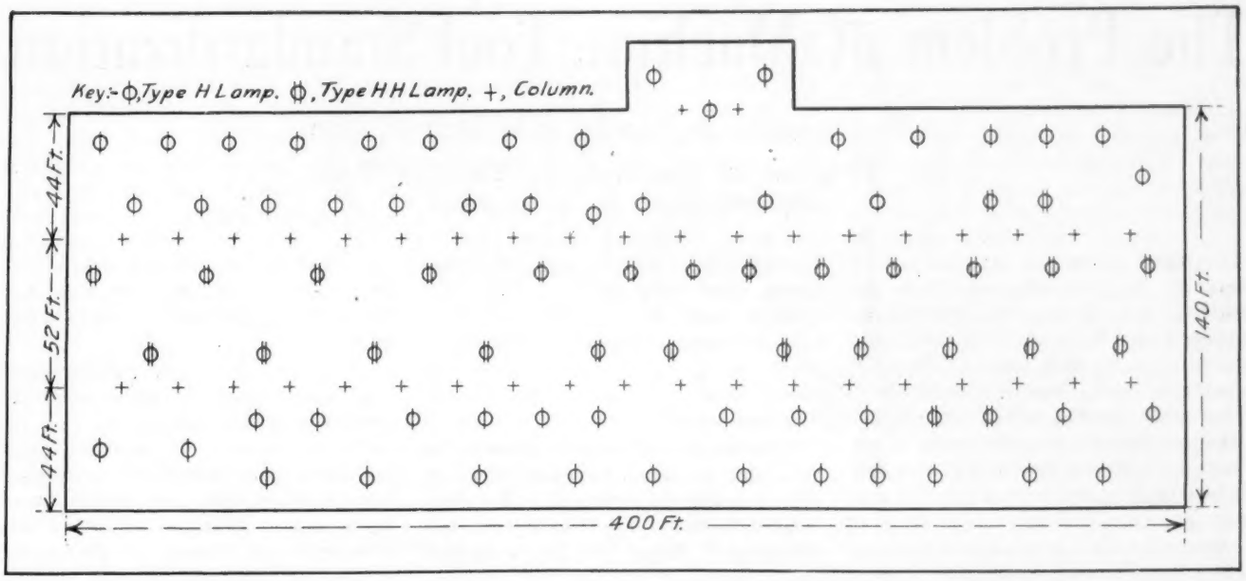


FIG. 8—FLOOR PLAN OF THE CINCINNATI PLANER CO.'S SHOP, SHOWING THE COOPER HEWITT LAMP LAYOUT

Cooper Hewitt installation consists of 22 type P, and two type H lamps. The height of suspension of the lamps on the first floor is about 14 feet, and on the second floor about 12 feet. The lamps are all operated on a normal supply voltage of 110 volts, direct current, at the terminals of the lamps. The total consumption is 8.9 kilowatts, and the approximate average is 0.4 watts per square foot, or 2.5 square feet per watt.

The Cincinnati Bickford Tool Co., Cincinnati Milling Machine Co., Cincinnati Planer Co., and the R. K. LeBlond Machine Tool Co., all installed their first Cooper Hewitt lamps, four and five years ago, in their old works.

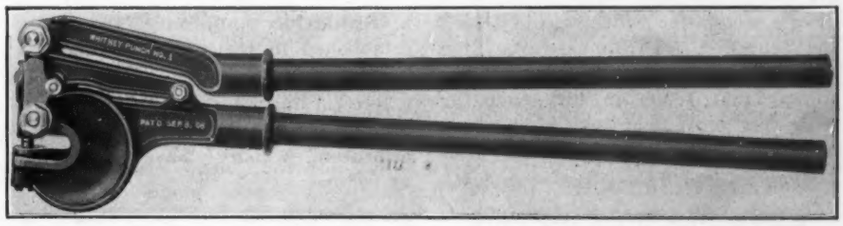
The Independent Pneumatic Tool Co., Chicago, has established an office in the Candler building, Atlanta, Ga. J. J. Keefe, who has been connected with this concern for several years, as southern traveling representative, has been appointed manager of this office. A complete line of pneumatic tools and patterns will be carried in stock for the convenience of the southern trade.

Electric Converter

For the direct conversion of cast iron into steel, a converter arranged for the application of the electric current has been patented in Germany by H. A. G. Cinille. Either a side or a bottom blown converter may be used, and after the metal has been blown, the vessel is turned down to a horizontal position and two electrodes are inserted through the lining at the back of the converter for the purpose of refining the steel. To facilitate the introduction of the electrodes two openings are provided in the back of the converter at a point just above the tuyeres. The electrodes are suspended from supports independent of the converter, and are so arranged that they can be conveniently raised or lowered through the openings in the converter to a working distance above the bath.

Portable Hand Punch

The accompanying illustration shows a new portable hand punch manufactured by the W. A. Whitney Mfg. Co., Rockford, Ill. It is designed to meet the need for a portable tool having sufficient capacity to punch heavy plates, beams, etc., in boiler and structural shops. The total length of this tool is 34 inches and its weight is 21 pounds, so distributed that it balances easily. It will punch a 9-16-inch hole through ¼-inch plate and is designed so it may be fitted with dies in various sizes up to 9-16 inch in diameter. The general construction of the tool is clearly indicated in the illustration. It is claimed it will do the work of many heavy floor and stationary punches and has the additional advantage of being easily portable and suitable for use in the field without a vise.



WHITNEY HEAVY DUTY HAND PUNCH

New Wire Works

The Wire Specialty & Machine Works, South Bend, Ind., manufacturer of special machinery and automatic wire work, advising respecting its recently noted incorporation, says that it has taken over the business of the Wire Specialty Works, of Chicago, and is operating the plant of the Long Distance Telephone Mfg. Co., South Bend, Ind. The company states that it is not in the market at present for new machinery of any sort, as it has a very fully equipped shop, consisting of automatic wire forming machines, wire straighteners, several machines designed and built by the company itself for the manufacture of special forms of sheet metal, a large machine for forming sheet and metal studding, with a capacity of 5 miles of studding a day; automatic screw machines, turret lathes, shapers, planers, punch presses and general machine shop equipment. The officers of the company are: President, Marvin Campbell; secretary and treasurer, Gerald Mahony. The superintendent, Thorvald Hansen, was formerly superintendent of the Chicago Brass Co., at Kenosha, Wis., and has had a broad experience in designing and building special machinery.

The Problem of Machine Tool Standardization[1]

A Discussion of the Benefits to be Derived from the Adoption of Standards by Users of Tools

By L. P. Alford

Standardization of product is a necessity in manufacturing. It is the starting point in every attempt to produce great quantities of parts cheaply and uniformly. The advantages are readily recognized. There are similar advantages in the standardization of processes and tools used in manufacturing, and this broad fact is the reason for this paper.

The problem of standardizing machine tools is very important. I propose to treat it in a manner to establish the principles which should be followed to obtain the desired uniformity in details, rather than to go very far into the details themselves, except by way of illustration.

Before beginning my argument with reference to mechanical details I must refer briefly to the nomenclature of machine tools and their parts. You have a committee which is considering the question of standardizing the names of machine tools. Permit me to say that I am in full sympathy with this movement and hope for a speedy report and action by your body.

Nomenclature of Machine Parts.

But is there not a wider field that your committee might consider than merely the generic names of the machines? Why not take up the names of individual parts? No argument is needed to convince you of the confusion that now exists. Take the common word *dog*. There are probably as many varieties of inanimate dogs as there are species of canines shown on the benches of the average dog show.

What is the distinction between a table and a platen, between an arbor and a mandrel, between a bed and a base, between a pillar, a post and a column? What is a jig, a fixture, and so on?

Lest you think I am wandering from my subject, I hasten to point out the connection. The foreign user must not be forgotten. Whatever simplifies the descriptions of machines facilitates translation and comparison and is a direct aid to him in getting a mastery of the situation. In the interest of technical accuracy it is very much to be desired that a reasonable uniformity should be established in the names of machine parts.

But turning to the machines, there are six important principles in standardization, which I have formulated, as follows:

1. Standardize corresponding designations and capacities and establish a method of power rating.

2. Standardize devices for holding cutting tools.

3. Standardize devices for holding work and fixtures.

4. Standardize operating movements.

5. Standardize parts concerned in the setting-up of machines with reference to the permanent shop equipment.

6. Accept the geometric progression as a fundamental requisite in designing feeds and speeds.

The application of none of these principles will introduce a radical change in design, for, on the contrary, either through action by this association or through a process of natural development, uniform features can be pointed out substantiating the importance and setting a precedent for the application of each principle.

The first principle aims at a standardization of corresponding machine designations and capacities, and the establishing of a method of power rating. In 1903, action was taken by a number of milling machine manufacturers establishing the maximum feed travels for various sizes of knee-and-column milling machines. For example, the maximum feed travels for a No. 2 universal machine were fixed as follows: Longitudinal, 25 inches; cross, eight inches; vertical, 18 inches. This was a start toward standardizing designations and capacities. The resulting uniformity is of advantage to the buyer in comparing the various makes of machines designated as Nos. 1, 2, 3, 4, etc.

But this is only a beginning.

To develop the point let me ask what is a 14-inch, 6-foot bed engine lathe? To answer my own question, I don't know. From data that has

DIMENSIONS OF SIX NO. 2 MILLING MACHINES

SPINDLE DETAILS				TABLE DETAILS						COLUMN DETAILS							
Thread on nose..	Taper hole in... spindle	Width of slot in end of spindle, inches	Distance column face to spindle end inches....	Thread of draw-in bolt.....	Working surface of table, inches	Number of T-slots	Size of T-slots, inches	Spacing center to center of T-slots, inches...	Telescoping screw	Width of face of column, inches	Angle of V on column, degrees	Distance column goes angle above spindle center, inches..	Over arm diameter, inches....	Outboard bearing diameter, inches	Circ. speeds of pulleys, r. p. m.	Weight .....
2½ inches diam., 4 thds. per in., L. H., U. S. S.	10	none	1⅜	None, bolt not furnished.	39¼ x 10¼	3	⅝	2½	yes	9⅛	50	5½	3½	1 13-16	450 505	2,850
2 inches diam., 8 thds., U. S. S.	10	none	3¼	⅝ inch, 11 thds.	43¾" long, 10" wide	3	⅝	2 5-16	yes	10	45	2¾	4¼	2⅜	510 650	3,050
2½ inches diam., U. S. S., 4 per in., L. H.	10	none	3	⅝ inch, 11, U. S. S.	39 x 10½	3	⅝	3	yes	9¾	50	3½ below	3¾	1⅜ 1⅞	420 470	2,600
Five per inch	10	1 5-16	3⅞	12 thds. per inch.	11¼ x 47¼ length over all 52	3	⅝	2½	yes	10⅛	45	2½	3¾	11-16	580 785	2,460
2¼ inches x 12	10	none	1⅜	⅝ inch, No. 11.	41 x 10	3	⅝	2¼	yes	9½	40	about even	4	11-16 1 13-16	590 730	2,850
2½ inches diam., 1¼ lead, ¼ pitch, U. S. S.		1 35-64	3¼	⅝ inch, 11 thds.	47¼ long, 11 wide	3	⅝	2 5-16	yes	10⅜	45	2⅝	4¼	2⅜		

[1]Presented at the New York meeting of the National Machine Tool Builders' Association.

been prepared comparing some of the dimensions of a number of 14-inch, 6-foot bed engine lathes, it is found that the diametrical swing over the bed ranges from 14⅛ to 16⅛ inches; the swing over the plain carriage from 7½ to 10¾ inches, and the maximum distance between centers from one foot, six inches to three feet, three inches.

From the user's standpoint, it is as important to know the diameter that can be swung and turned over the carriage as it is to know the maximum diameter that can be swung over the ways. And the length of the bed is of no more interest than the height of the lathe hand that operates it. A similar argument can be presented for other kinds of machines, but would only serve to unnecessarily lengthen this discussion. Is there not an opportunity to bring about reasonable uniformity of corresponding designation and capacity, making these descriptive?

Power Rating.

Turning to the question of power rating, the user should have some means of distinguishing between the relative capacity for removing metal and mechanical efficiency of machines of the same dimensional capacity. If he asks for bids on a 20-inch, 10-foot engine lathe, and in one case is quoted $600 and in another $450, he should have some means of knowing that the difference in price represents a difference in metal-removing capacity of the tool. Let me call attention to the phraseology that I have used in connection with this point; that is, to establish a method of rating; not to establish or standardize ratings themselves, development is giving us light-powered and heavy-powered machines; each kind has its field, but there should be some way to differentiate them except by name.

Discussion of the Second Principle.

The second principle refers to standardization of devices for holding cutting tools. The small tool equipment of a shop represents a large investment. The more adaptable this equipment is, the fewer pieces there need to be in use; the greater the number of hours each small tool can be at work and, therefore, the greater the operating efficiency of the shop. The interchangeability of lathe tools and tool holders throughout the tool posts of all lathes of a given size, the interchangeability of milling cutters and their collets among machines of different makes, the interchangeability of drill chucks throughout all the drilling machines of a given department, and so on, represents a real increase in efficiency which is so apparent, merely to need mention to be recognized. To show that this principle has already influenced design, I have but to refer to the taper of the hole in the spindles of milling machines. For the No. 2 milling machines, whose dimensions were tabulated, all had the hole in the spindle conforming to Brown & Sharpe's No. 10 taper. Similarly, for the No. 3 milling machines, the spindle taper was found to be uniformly Brown & Sharpe's No. 11. Again, the Morse taper is extensively used in drilling machine spindles; in the ten 14-inch engine lathes investigated, the majority of the tools' post slots were found to be made for ½ x 1¼-inch tools.

The third principle proposes to standardize devices for holding work and fixtures. The arguments presented in favor of standardizing the devices for holding cutting tools apply here with even greater force, for the devices and fixtures for holding work are more expensive as individuals than are separate cutting tools. Consider the advantages of having chucks interchangeable throughout all of the lathes of a given size in a lathe department, or consider the advantage of uniform T-slots throughout all kinds of machine tools of relative, similar sizes. A milling fixture can then be used on any milling machine of a given number, holding-down bolts can be standardized as regards the sizes of heads, with the full assurance that they can be used on a milling machine, or drilling machine, or planing machine, or lathe, as the case may be. In addition to the enormous saving in original investment and increased flexibility of the equipment, there is an attendant saving in the time required on the part of the workmen to find devices that can be used.

Discussion of the Fourth Principle.

To show that something has been done in recognition of this principle, I have but to refer to the table slots of milling machines. Of the milling machines investigated, the table slots were uniformly ⅝ inch.

The fourth principle refers to the standardization of operating move-

DIMENSIONS OF SIX NO. 3 MILLING MACHINES

	Spindle details.					Column Details.											
	Thread on nose.	Taper hole in spindle.	Width of slot in end of spindle, inches.	Distance column face to spindle end, inches.	Thread on drawing bolt.	Working surface of table, inches.	Number of T-slots.	Size of T-slots, inch.	Spacing center to center of T-slots, inches.	Telescopic screw.	Outboard bearing, diam., inches.	Width of face of column, inches.	Angle of V on column, degrees.	Distance column angle goes above spindle centers, inches.	Over arm diameter, inches.	Circumferential speed of pulleys, r. p. m.	Weight, pounds.
3¼ inches diam., 3½ threads per inch L. H., U. S. S.....	11	1½	1⅞	none, bolt not furnished	53 x 12¼	3	⅝	3	yes	2⅛	11½	50	6¼	4¼	760 600	4,350
2½ inches diameter, 6 threads, U. S. S.....	11	none	3	⅝-11 threads	52 long 12 wide	3	⅝	2⅝	yes	2⅜	10⅞	45	2⅛	4½	765 1,225	4,350
3¼ inches diam., U. S. S., 4 per inch., L. H.	12	1½	3⅛	¾-10 U. S. S	48½ x 13	3	⅝	3½	yes	1⅞ 2⅛	12	50	4 below	4½	1,640 1,640	6,700
Five per inch.....	11	1 $\frac{8}{16}$	3¾	12 threads per inch	13½ x 58¼ 63 over all	3	⅝	2½	yes	$\frac{11}{16}$	12	45	4½	4¾	660 800	4,200
2⅝ inches x 12..... 3¼ inches diameter, 1⅔ lead, ⅓ pitch, U. S. S.....	11	none	1½	⅝-No. 11	49 x 12	3	⅝	3½	yes	$\frac{11}{16}$ $\frac{11}{32}$	10½	40	6½	4½	715 1,080	4,200
		1 35/64	3¼	⅝-11 threads	55¾ long 13½ wide	3	⅝	2⅜	yes	2⅜	11¾	45	2¾	4½		

ments. Rapid repetition work depends very largely upon the sense of touch of the operator. Frequently repeated movements become, to a great degree, involuntary. It, therefore, follows that a standardization of the operating movements of machine tools will contribute to an operator's speed by making his motions, to an extent, involuntary and permitting him to change from one make of machine to another without any disturbance to the habits that he has formed. On all standard lathes, the same direction of motion of the footstock handle should advance the spindle toward the head. Similarly, a definite direction of motion of the hand wheel on the carriage should advance the carriage toward the head, and so on, for the other hand-operated movements.

To show that this principle has been recognized, in the engine lathes investigated the direction of motion of the operating handles was uniform to produce a corresponding movement of the operating parts.

DIMENSIONS OF TEN 14-INCH LATHES

Swing.			Spindle Details.							
Swing over bed.	Swing over carriage.	Swing between centers.	Spindle nose	Taper of hole.	Centers.	Hole in spindle.	Weight, 6 ft. bed, pounds.	Lead screw.	Belt speed.	Size of tool, inches.
	8½		2¼ x 6	Morse 4	M 2	1	1,715	6	285-362	½ x 1
14⅛	8⅜		2⅜ x 6		M 3	1¼		4	645-785	½ x 1
15¼	9½	3 3				1 5/16		8	950	
16	10½	3	2¼ x 8			1⅜	1,600	5	475	½ x 1
15¼	10¾		1⅞ x 8			¾		6	375	
15¼	9⅜	3 4	2⅛ x 5		M 3	1 1/16	1,650		350-475	⅝ x 1
14¼	7½	2 11	2¼ x 7			1⅛	1,550		585	
15¼	8½	2 6	2⅜ x 7		M 3	1¼	1,825		380-485	½ x 1
14⅜	8⅜	3 1	2 x 7	⅝ per ft.	M 2	1 3/64	1,600	6	375	½ x 1
16⅛		3	2 5/16 x 6	⅝ per ft.	M 3	1⅜	1,850	6	525-660	⅝ x 1

Discussion of the Fifth Principle.

The fifth principle sets forth the standardization of parts concerned with the setting-up of machines with reference to permanent shop equipment. There are only a few points to be considered here, such as the spread of the bolt holes in the feet of the countershaft hangers, the drop of the shipper rod, and for motor-driven tools the dimensions of the motor feed pads. I understand that a committee of your association has consulted with a committee of electrical machinery manufacturers in regard to this latter feature, but that thus far a working basis has not been reached. I need not dwell upon the advantage to the user in being able to buy a machine that meets his needs from a machine tool builder, and a motor adapted to the machine from an electrical machinery manufacturer, and assemble them himself with every knowledge that they will fit.

Discussion of the Sixth Principle.

The sixth principle refers to an acceptation of the geometric progression as a fundamental requisite in determining relations throughout the chosen ranges for feeds and for speeds. I have reason to believe that this principle is very generally recognized among you, especially among those producing milling machines. But there seems to be a wide difference in the ratios aimed at. Personally, I am not in a position to make any definite recommendation along these lines, other than to state the general principle.

To make my argument complete, it is evidently necessary to prove that a lack of uniformity exists in connection with the features covered by the principles outlined above, and at the same time that these differences are of such a nature as to indicate that uniformity can be established. To meet this requirement one of my associates has prepared four tables that form an appendix to this paper. Two refer to lathes and two to milling machines, and give, respectively, an analysis of many of the features capable of being standardized for 14-inch and 20-inch lathes, No. 2 and No. 3 milling machines.

The following lists of features to be considered for standardization are for the four fundamental machines, lathes, planers, drilling machines and milling machines. This does not imply that standardization cannot be carried on in connection with some other machines, but the limit of time prevented a consideration of them. However, the principles laid down are of such a nature that they can and should be applied to all classes of machine tools that are of a fixed type and made by a number of builders. The real work of determining dimensions is a long, tedious task, and cannot be done in a weak-kneed, faltering manner.

Personal experience in the work of standardization has taught me that the difficulties in the way are always magnified. The way is easily found if there is a will to do. What follows is suggestive only.

Engine Lathe Features to be Standardized.

Designations and capacities might be linked together by giving three dimensions: First, the swing over the ways; second, the swing over the plain carriage; third, the maximum distance between centers. Thus, a 14-inch, 6-foot bed engine lathe would become, say, a 14 x 8-inch x 3-foot engine lathe. The maximum swing over the ways should be fixed for each nominal swing; the other dimensions to be exact.

As a suggestion merely, is it necessary to have so many nominal sizes of lathes as are now built and listed? As now arranged, these sizes roughly form an arithmetical progression, having a common difference of two inches. Has anyone considered arranging these sizes in a geometric progression with the direct purpose of reducing their number? If anyone is interested in this speculation let him start a progression with ten inches and apply the ratio 1.2.

A standard method of power rating might be to give the horsepower of the driving belt for the machine; this power to be figured by means of a determined formula with determined factors for single, double and triple belts. This same rating could apply whether the machine was belt-driven or motor-driven, for a given type and size of machine is usually built for both methods of applying power. This will permit a careful designer to develop a design and have a proper relation between power and rigidity. It will also permit the user to compare mechanical efficiencies.

For each nominal size of lathe the following details of designs should be standardized: The diameter, thread, and length of spindle nose; taper of hole in spindle; diameter of hole through spindle; taper of the centers; hole, keyway, face, pitch and kind of teeth of change gears for the ordinary screw-cutting type; number of threads per inch of the lead screw; size of T-slots in wings of carriage, direction of motion of operating handles, controlling move-

ments of foot-stock spindle, carriage, tool block and compound rest.

Features of vertical drilling machines that should be standardized for each nominal size are: Dimensions of a table and of finished surface of base; distance from center of spindle to face of column; method of power rating; dimensions of the spindle nose, taper of the hole in the spindle; number, arrangement and size of T-slots in the table and base, maximum distance from spindle to table and from spindle to base; direction of motion of operating handles.

Planer Features to be Standardized.

The features to be standardized in connection with planers are: A method of rating; method of stating capacity; number and size of T-slots in the platen, and dimensions of reamed holes in platen and direction of motion of operating handles.

Milling Machine Features Standardized.

In the planing machine, drilling machine, shaping machine and lathe, we have a precedent for a form of designation that of itself indicates capacity. Is there any good reason why milling machines should not be styled in similar manner? To illustrate, is not a designation a 25 x 8 x 18-inch universal milling machine better from the viewpoint of conveying information, than to say a No. 2 universal milling machine?

Features to be standardized in connection with milling machines are: Designation and capacity; a method of rating; a length and width of working face of table; maximum distance from center of spindle to table; thread on nose of spindle; diameter of nose; taper of hole; width of slot in clutch end; diameter of clutch end and distance from face of column to end of spindle nose and taper of hole of spindle of vertical attachment and index head; diameter of over-arm; distance from center of arm to center of spindle; diameter of bore for outer arbor bearings; width of face of pillar and solid angle of edges; distance face extends above spindle center; number, size and spacing of table slots; diameter and thread on draw-in bolt; general position and direction of motion of operating handles.

Inter-Size and Inter-Class Standardization.

Thus far my argument has been directed toward standardization within the general limits of a given size of a given kind of machine. We must also consider the advantages of interclass standardization. But this discussion cannot be carried very far until detail dimensions have been tentatively determined upon for the various sizes of the various classes.

The establishing of a standard method of power rating has been touched upon. It is evident that such a method would apply to all sizes and all classes of machines.

Turning to details of design, a 5/8-inch T-slot should have the same dimensions whether it is in a milling machine table, a drilling machine base, a planing machine platen, the wings of an engine lathe carriage, or the table of a shaping machine.

If there is an advantage in being able to exchange chucks throughout the individual machines of a lathe department, is there not an added advantage if these same chucks can be used on certain sizes of milling machines? To put it a little more concretely, why should not the spindle noses of 16-inch engine lathes and No. 2 milling machines be identical, and again why should not the noses of No. 3 milling machines and 20-inch engine lathes be the same?

Movement of Operating Handles.

Turning to our fourth principle of standardization, should not the general position and direction of motion of the operating handles of a 14-inch lathe correspond with those of a 20-inch lathe? Should there not be similar uniformity between a No. 2 milling machine and a No. 3 milling machine, and so on?

Referring to our fifth principle of standardization, should not the space of the holes in the feet of countershaft hangers for countershafts of approximately the same weight and subjected to the same stresses, be uniform without reference to the machines they are used with? The advantage of such standardization in aiding the locating, spacing and setting-up of countershaft stringers is apparent. Again, should not the pads for the feet of a three-horsepower motor to be applied to a lathe be identical with those for a similar three-horsepower motor to be used on a milling machine?

As another general point, no screw or other part should be tolerated that has a travel of such a length that a hole must be cut in the floor to accommodate it. Machine users cannot countenance the cutting of holes in shop floors, particularly in buildings where the materials of construction are fire resisting.

It may seem to you that I have mentioned many points where uniformity already exists. If such is the case, the work of standardization is made all the easier, for all that is necessary is for your association to adopt them formally as your standard.

Finally, I wish I could make you feel the enthusiasm with which this matter has been received by ALL the machine users with whom I have discussed it. From the viewpoints taken, it has been evident that the advantages of such uniformity will be felt not only in large manufacturing departments of machine shops, but likewise in the tool-making room and in the job shop. Its advantages in all three of these places have been emphasized to me. One superintendent said in substance, the tool room is the place where the greatest good from such uniformity will be felt, for there the work is special, there we feel the need of interchanging tools between machine and machine, and the equipment will be made truly elastic if details are standardized. A works manager said: "Our large manufacturing departments are the ones that will be benefited by the establishing of such uniformity." And the proprietor of a jobbing shop added: "Such standardization will save me money every day, besides permit-

DIMENSIONS OF TEN 20-INCH 10-FOOT BED ENGINE LATHES

SWING.			SPINDLE DETAILS							
Swing over bed.	Swing over carriage	Swing between centers 10-foot bed	Spindle nose....	Taper of hole...	Centers	Hole in spindle.	Lead screw.....	Weight, pounds.	Belt speed.....	Size of tool, inches .....
	12¼	6′	3⅛ x 4	Morse 5	M 4	1½		3,800	375-500	⅝ x 1¼
20¼	12½	6′2″	3 x 6		M 4	1¾		4,000	660-843	
22½	14⅝	6′1″				1 9-16	4		445	
20½	12½	5′4″			1 25-32	1¾		4,600	880	
22⅛	13½	5′	3½ x 5		Morse	1½	4	4,200	660-825	¾ x 1½
21¼	13⅜	5′5″	2⅞ x 5		Morse	1 13-16		4,190	807	
20⅛	13½	5′6″	2¾ x 5			1¼		3,300	600	⅝ x 1¼
22	14⅛	5′9″			M 4	1½		4,200	330	
21¼	12¾	6′	2¾ x 6			1 11-16		3,800	347-460	⅝ x 1¼
20⅛	11¾	6′1″	3 x 6			1⅝		3,260		

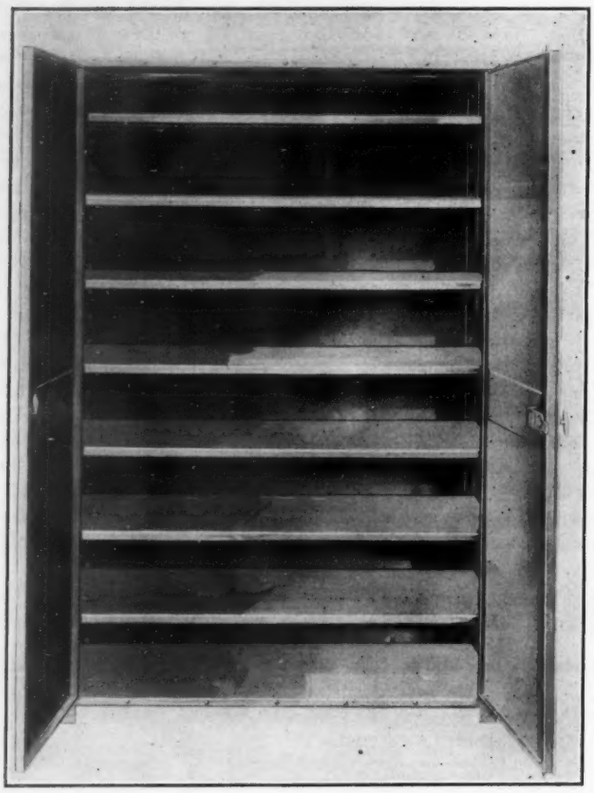


FIG. 1—SECTIONAL STEEL SHELVING, PROVIDED WITH DOORS FOR USE AS A CABINET

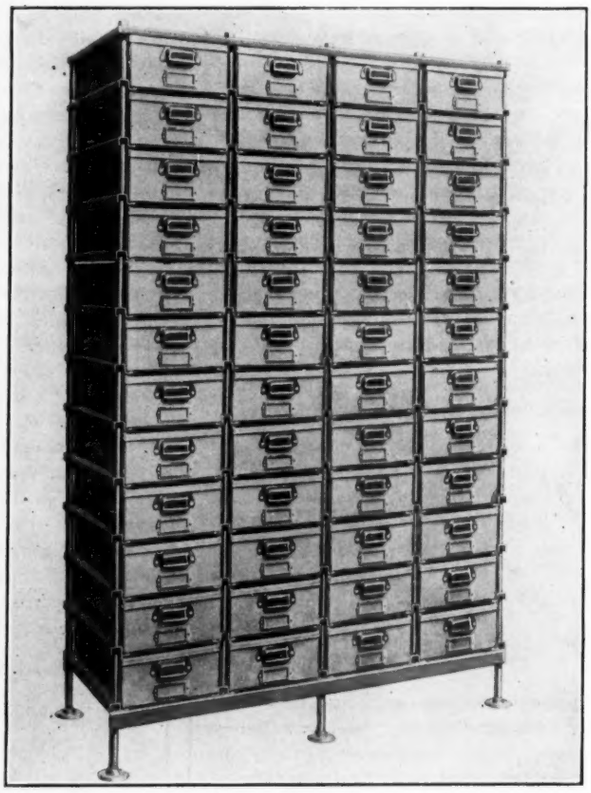


FIG. 2—ADJUSTABLE STEEL STORAGE RACK, EQUIPPED WITH DRAWERS

ting me to buy new machines of makes that I favor, but have not deemed it right to purchase in the past because in many of the essentials they differed from the equipment already in use. Should I have bought these machines I would have also had to buy a special tool equipment to go with them."

One enthusiast expressed himself by "me for it," while another man who has influenced the buying of $750,000 worth of machine tools during the past eight years, said: "Standardization of machine tools, as you have outlined it, is the greatest constructive step in machine-tool design that I can imagine."

STEEL SHOP FURNITURE.

In foundries, pattern storage buildings, machine shops and manufacturing plants generally, steel is supplanting wood in the construction of shelves, bins, racks, tool cabinets, etc. In addition to being fireproof, steel has many advantages over wood, and the sectional construction of shelving permits of its extension from time to time to meet the requirements for increased storage space. For the storage of cores, steel shelving is now being installed in many foundries and the adjustable feature of this equipment as well as its fireproof qualities, makes it particularly desirable for use in pattern storage buildings. In machine shops steel bins are used for the storage of castings and other small parts, while steel cabinets, provided with steel doors which can be locked, serve for the storage of tools, jigs, dies, etc.

The Cleveland Wire Spring Co., Cleveland, makes a specialty of manufacturing steel shop furniture and the type of sectional steel shelving now being buil is illustrated in Fig. 4. The uprights are made of steel angles which are punched for the purpose of permitting the adjustment of the shelves on 3-inch centers. The shelves are flanged on all sides and are reinforced with angles on the ends. The shelves, which are built for loads of 200 pounds per square foot, are bolted to the steel uprights. This style of shelving can be built any desired height and width and can be provided with locks and bin fronts as well as bin partitions for the storage of small parts, such as castings, screws, bolts, nuts, etc. Fig. 1 shows a section of this shelving equipped with steel doors, making a suitable cabinet for tools, dies, jigs, etc.

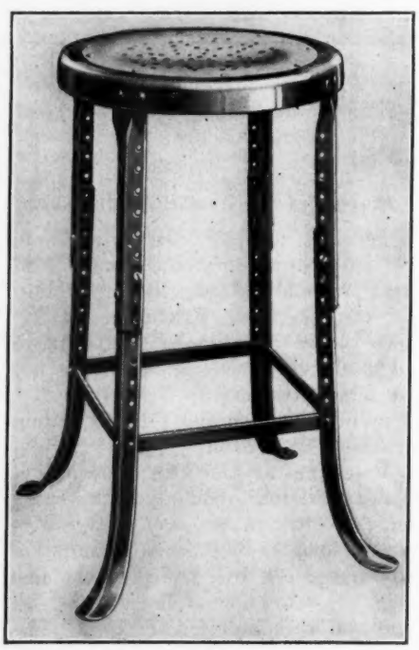


FIG. 3—ADJUSTABLE STEEL STOOL FOR CORE ROOM USE RESPECTIVELY

An adjustable steel storage rack, equipped with drawers and provided with card holders, is illustrated in Fig. 2. The rack consists of a steel skeleton frame and the end rods as well as those dividing the sections of drawers carry the sections of pipe over which are set the channel steel sections which serve as slides for the drawers. Drawers of any depth can be furnished and the only change in construction necessary is in the section of pipe over which the steel slide is set. This storage rack can be built any height and with any number of sections. The up-

right rods are bolted to the top of the rack, thereby making the rack exceedingly rigid. The drawers are made of Nos. 16, 18 or 20-gage steel, according to the load to be carried and are of the reinforced, folded type of construction.

A steel stool for use in core shops where wooden stools and benches have only a short period of usefulness, owing to heat and dry air, is shown in Fig. 3. The legs are made of steel angles and are adjustable to any height. To the tops of the steel angles is riveted a stamped steel ring in which is placed a laminated wooden seat. This stool is also made with solid steel legs and can be furnished with a stamped steel seat. The seats of all the various types of stools built are 14 inches in diameter.

New Catalogs

BORING MILLS.—The Gisholt Machine Co., Madison, Wis., has issued a new leaf for binding with its loose leaf catalog. This page is devoted to installations of Gisholt vertical boring mills.

LOCOMOTIVE CRANES. — Locomotive cranes of the Brownhoist type are described in a catalog issued by the Brown Hoisting Machinery Co., Cleveland. The book is provided with a large number of illustrations which are intended to show typical installations of the cranes as used for varying purposes. Most of the illustrations show the crane equipped with the bottom block and lifting magnet, while a few are equipped with Brownhoist grab buckets.

FUEL OIL BURNERS FOR LIGHTING CUPOLAS.—In an eight-page bulletin issued by the Hauck Mfg. Co., 140 Cedar street, New York City, the application of fuel oil burners for lighting cupolas is described and numerous illustrations are given, showing not only the method of lighting cupolas, but line drawings are included showing the arrangement of the coke bed to insure its lighting most economically and efficiently. It is claimed that the fire can be lighted at a maximum cost of 10 cents for oil consumption and, in addition, the smoke nuisance is entirely eliminated.

CUTTER GRINDERS.—A 16-page catalog, issued by the Ingersoll Milling Machine Co., Rockford, Ill., is devoted to its new type of cutter grinder described in THE IRON TRADE REVIEW Aug. 31. The machine embodies a number of original features which combine to make a convenient and accurate face mill grinder. The cutter is well illustrated and shows the adjustment of the grinder for various classes of work and an illustration is included of the Ingersoll Milling Machine Co.'s method of milling six grinder beds at one setting. These beds are finished on an 80-inch x 30-foot, four-head Ingersoll milling machine.

COMPRESSORS.—The Ingersoll-Rand Co., 11 Broadway, New York City, in a 24-page bulletin, illustrates and describes power-driven air compressors of the duplex type with the air cylinders close-coupled to the frame and equipped with a central driving wheel. Several views of the machine, in section, are shown and tables of sizes and capacities are included. The distinctive features of this design are massive and powerful construction and the machine is readily accessible both inside and outside. Automatic control of the pressure and regulation of output to loads are provided by governing devices. The air compressor has a flood lubrication system.

STEAM POWER ECONOMY.—"Economical Steam Power Plants" is the title of a 24-page, 9 x 12-inch pamphlet, issued by the Green Fuel Economizer Co., Matteawan, N. Y. Four of the largest modern steam power plants are described by well-known authorities and include the Hudson and Manhattan Power Station at Hoboken, N. J.; the 120,000-horsepower St. Denis plant near Paris; the plant of the Laclede Power Co., St. Louis, and the electric plant at Vitry sur Seine. The articles include plans, elevations and engineering information relative to proportions and types of equipment, and figures are also included showing the results of comprehensive tests of the several plants.

TITANIUM RAIL TESTS.—The Titanium Alloy Mfg. Co., Pittsburgh, is sending a circular to the trade which contains the results of a second series of rail tests on the Baltimore & Ohio railroad of titanium Bessemer rails and ordinary open-hearth rails. During 338 days of service the percentage of wear of plain open-hearth rails averaged 0.277 per cent while the wear of titanium Bessemer rails treated with 0.15 per cent metallic titanium averaged 0.177 per cent. The carbon content in the plain, open-hearth rails averaged 0.64 per cent, while that contained in the titanium Bessemer rails only averaged 0.47 per cent. The difference in the cabon content in favor of the open-hearth steel rail was 0.17 or 36 per cent.

STEAM TURBINES.—In a 32-page pamphlet, entitled "A Steam Turbine for Driving Direct-Current Generators" the DeLaval Steam Turbine Co., Trenton, N. J., considers the subject of steam and bucket velocities; different methods of speed reduction by means of velocity stages and pressure stages as well as combinations of the two and by means of gears; the peculiarities of turbo-generators and turbine-driven direct-current generators, etc. The use of a number of stages instead of one stage, as in the DeLaval single-stage turbine, permits of turbines of moderate diameters being built for the largest capacities, since with the lower speed, longer vanes or buckets can be used in the low pressure stages. The booklet describes a line of machines in which this idea has been developed.

HOT BLAST HEATING AND VENTILATING.—In a 94-page booklet, entitled "Heating and Ventilating," the Green Fuel Economizer Co., Matteawan, N. Y., has gathered together the necessary information required for designing and proportioning hot blast outfits for heating, ventilating, drying, etc. The work contains a large number of tables, including temperatures required in rooms for various purposes, heat transmission through building materials, heat given off by occupants and lights, standard sizes of hot blast heaters, frictional resistance of air washers, relative humidities, humidities and temperatures throughout the United States, amounts of air required for ventilation, equivalent air pressures, velocities and horsepowers, total weight of air at various barometers and temperatures, pressure and power consumed in friction, speed, capacity and power of steel plate fans, friction of air through hot blast coils, etc. The text covers not only the usual details relating to the construction of fans, heaters and heating and ventilating systems, but also the calculation and designing of piping systems. A chapter is devoted to the loss of head of air flowing through orifices and equivalent orifices in which is presented a method of combining the resistances of ducts in parallel and series connections, analogous to the Ohm and Kirchoff laws for electrical circuits. The illustrations include not only views of buildings equipped with heating and ventilating apparatus built by the Green Fuel Economizer Co., but also detailed plans, elevations, etc., showing the arrangement of the fans, heaters, piping, outlets, etc.

FIG. 4—SECTIONAL STEEL SHELVING, BUILT BY THE CLEVELAND WIRE SPRING CO.

A New Co-Operative Course for Apprentices

Details of a Practical System of Instruction for Boys Who Wish to Excel in Foundry Work, Patternmaking and Machine Shop Practice

The industrial and educational world is familiar with the co-operative courses in engineering established at the University of Cincinnati by Prof. Herman Schneider, and the tremendous success which this scheme of education has achieved is a matter of common knowledge. There is now being offered by the Lewis Institute, Chicago, a co-operative course for shop apprentices which is the result of two years careful experiment and embodies many advanced ideas in industrial education. In accordance with the plan adopted at the Cincinnati University, the boys in the new course at Lewis Institute work in pairs; one spends his time in some regular commercial shop, while the other receives instruction at school and at the end of each week they change places. But at this point the similarity between the two systems of instruction ceases.

Courses Compared.

At the University of Cincinnati the courses follow the regular technical routine leading to engineering degrees and a high school education or its equivalent is required for admission. At Lewis Institute the work is arranged for shop apprentices who intend to remain in the shop as expert workmen, foremen or superintendents after their school days are over and who do not intend to become engineers; no special preliminary training or educational qualifications are required for admission. In short, the Lewis Institute co-operative course aims to supply a greatly needed link in our industrial training system, by furnishing the widely demanded general and specific instruction required by ambitious workmen who wish to excel in their trade and make the shop the scene of their careers. The course is expected to go a long way toward providing the breadth of knowledge and experience necessary to successfully fill the position of foreman or superintendent. To a certain extent, at least, it is hoped the training given will so fit young men with natural executive ability that, with a little additional practical experience, they can meet the widespread demand for capable foundry foremen.

For the present the courses will be confined to the engineering trades, special attention being given to foundry practice, patternmaking and machine shop work.

Lewis Institute is situated in the heart of the manufacturing district of Chicago. It is primarily a school of mechanic arts and engineering, its purpose being to provide such technical training as underlies a large number of occupations in which skill and intelligence are demanded. It aims to raise the worker's scale of wages, to improve his standard of living and to enlarge his field of usefulness by placing within his reach opportunities for advancement suited to his capacity and needs. The school, it is thus seen, is intensely practical.

The new co-operative course for shop apprentices is the outgrowth of considerable study and experiment. In the spring of 1908 the Chicago branch of the National Metal Trades Association appointed a committee on industrial education of which the following were members: John B. Hibbard, F. S. North, John W. O'Leary, H. E. Goodman and P. W. Gates. This committee met with George N. Carman, director of Lewis Institute, and worked out a scheme for training apprentices for the mechanical trades. As a result of this work a plan of

FIG. 1—A CORNER IN THE FOUNDRY OF THE LEWIS INSTITUTE, CHICAGO

co-operation between certain shops in Chicago and Lewis Institute was decided upon.

Boys Who Take the Course.

It was thought that the boys most likely to take advantage of this course would be, first, those who were working in shops either as apprentices or employes; second, boys, who from necessity or choice, had left school to go to work and had drifted into occupations that did not offer opportunities for advancement, and third, boys in school who were either unable to continue without financial assistance or who were dissatisfied with the kind of training they were receiving and would welcome an opportunity to work at some mechanical trade a part of the time and still continue in school.

It was the opinion of the committee that a large majority of these boys would be unable to make the sacrifice in wages or give the time from their apprenticeship period that a long course would demand. Accordingly, a two-year course was decided upon, with alternate weeks in school and shop. Each class is divided into two sections and the boys pair off, thus insuring a constant employe at the shop and uniform classes at school. The boys are paid by their employers for their shop work in accordance with a scale which is given subsequently. The plan calls for 26 weeks in the shop, 22 weeks in school and four weeks vacation each year.

In offering this course it is not the idea of the manufacturers concerned or of the institute that the students will become skilled workmen in two years, but work in the shop combined with instruction in the school will give them a much more intelligent idea of their trades than they could otherwise obtain.

Any boy between 16 and 21 years of age who can satisfy his employer that he is capable of doing the work in the shop and satisfy the institute that he is prepared to profit by the instruction is eligible to take the course. No formal examination is required.

The tuition for the two years of cooperative work is $100, divided into quarterly payments. Boys who are unable to meet this expense, but who do satisfactory work during their first term are relieved from paying tuition through the operation of the Noyes scholarships, as will be explained later in this article.

The questions now arise, what kind of boys take advantage of this course, just what training do they receive in school and in the shop, where do they go and what are they good for when they graduate?

FIG. 2—A CORNER IN THE PATTERN SHOP OF THE LEWIS INSTITUTE

In December, 1910, 20 boys completed the two years' work out of 47 starting, for it will be remembered the work has been tried out experimentally a sufficient length of time to graduate one class. Of the 47 starting, 14 were already working in the various co-operating shops and 33 were recommended by the institute. Their average age at entrance was 18 years and one month. Seven had attended one year at high school, two had only completed the sixth grade, while a number had been out of school several years. These were slow getting on at first and were inclined to be discouraged, but after a few months they made rapid progress and at the end of the course seemed to have as comprehensive an understanding of the subjects covered as did those who had the advantage of several more years' schooling.

In the various shops in which the boys are employed they are placed side by side with the regular workmen and are given such tasks as their experience and capacity permit. It is the aim, however, of the various cooperating manufacturers to give the boys as wide and varied a line of work as possible without interfering with the regular manufacturing operations. While in the shop the boys conform to the same hours, rules and other conditions surrounding the regular employes. In short, while they are in the shop they are an integral part of its organization, and the discipline and knowledge of shop administration thus obtained is invaluable. As suggested, these boys are not being trained to be engineers, but to become foremen or shop executives and their training in the various manufacturing plants is consequently more detailed.

Instruction in Foundry Work.

Those who elect to specialize in foundry work are, in the course of the two years, given a chance to learn the details of both hand and machine-molding, core room practice and pat-

FIG. 3—MACHINE SKETCHING AND STUDY OF PATTERNS

FIG. 4—A CLASS IN MECHANICAL DRAWING

ternmaking. A special effort is being made to interest as many of the co-operative students as possible in foundry work on account of the exceptional opportunities in this field and the great demand for skilled, capable foundry executives.

For his shop work the boy is paid according to the following scale:

	Cents an hour for all shop time.
First six months	12
Second six months	13
Third six months	14
Fourth six months	15

As there are some employers who prefer to pay the boys for all the time whether they are in the shop or in the school, the following equivalent scale is used:

	Cents an hour for all school and shop time.
First six months	6½
Second six months	7½
Third six months	8½
Fourth six months	9½

During the year the employers as well as the superintendents and foremen of the shops in which the boys are employed, visit the classes at the institute and make helpful suggestions. Once a year the boys, their employers and instructors get together for an annual dinner. Addresses are made by a number of employers and occasionally by outside engineers.

Firms Co-Operating.

Up to the present time 27 firms, including many of the most prominent manufacturers in Chicago, have made arrangements to co-operate with the Lewis Institute in this work. These include the Acme Steel Goods Co., Aermotor Co., Allis-Chalmers Co., Benjamin Electric Mfg. Co., Borland-Grannis Co., H. W. Caldwell & Son Co., A. Finkel & Sons Co., E. Goldman & Co., Goodman Mfg. Co., Gregory Electric Co., Hanna Engineering Works, W. S. Jones Foundry & Machine Co., Kroeschell Bros. Co., Latham Machinery Co., Link Belt Co., Mehle Printing Press & Mfg. Co., Pelouze Electric Heater Co., Roth Bros. & Co., Simonds Mfg. Co., Sullivan Machinery Co., Temple Pump Co., Thordarson Electric Mfg. Co., Union Special Machine Co., Weir & Craig Mfg. Co., Weller Mfg. Co., Fred W. Wolf Co., and Wood Motor Vehicle Co.

FIG. 5—MECHANICAL LABORATORY; TESTING THE STRENGTH OF MATERIALS

Noyes Scholarships.

In December, 1909, La Verne W. Noyes, who had a number of co-operative students in the shops of the Aermotor Co., Chicago, learned that there were many deserving boys who were anxious to take the course, but who were unable to pay the tuition out of the small wages earned. Realizing that the course would fail of its purpose unless it was possible for these boys to take full advantage of it, Mr. Noyes generously offered to pay the tuition of all co-operative students who should do earnest work in both school and shop. He has thus showed his appreciation of what has been done and has made it possible for boys to become competent workmen, who otherwise might have been obliged to do work which would qualify them for nothing in particular and which would offer no opportunities for advancement. Mr. Noyes has agreed to offer these scholarships to the aggregate of $10,000 a year. At the end of each term all the co-operative boys employed in the mechanical trades who present a card signed both by their employers and instructor in charge stating that they have done satisfactory work, are given a scholarship which entitles them to a term's tuition.

During the winter the school sessions extend from 8:40 a. m. to 5 p. m. and in the summer from 8:10 a. m. to 4. p. m. In the two years' course, instruction is given on 14 different subjects, of which the most important are shop mathematics, machine sketching, machine shop, foundry and pattern shop practice, mechanical drawing and shop organization. The work in drawing is designed to familiarize the student with drawings and to enable him to read them quickly and accurately, rather than to make him a draughtsman. The course in shop mathematics is planned to give a ready command of the principles of mathematics in dealing with problems which arise in shops and factories. The importance of short methods and common sense checks is emphasized and as far as possible the memorizing of rules and processes is avoided.

Lewis Institute has a very completely equipped machine shop, in which the co-operative students are taught the principles employed in the various processes used in modern ma-

chine tool operations. The construction and methods of manipulation of the different machines are explained and the mechanisms used by different builders of similar tools to obtain speed and feed changes are examined and described. Special study is made of cutting tools with reference particularly to heat treatment and proper grinding. Practice is also given in the operation of the various common machine tools, including plain and differential indexing on the milling machine. The instruction in the operation of the machines is largely individual and the work done depends entirely on the ability of the student.

The School Foundry.

The foundry at Lewis Institute is completely equipped with modern appliances for instruction in hand and machine-molding, coremaking and bench work. In the course of his work in the institute foundry, the student learns the various practical details of foundry operation, special attention being devoted to a study of cupola mixtures and the making of high grade machine castings of gray iron and brass. The institute foundry is conducted very much as a jobbing foundry and the students are required to work in all departments. Visits are also made to both light and heavy jobbing foundries and also to a number of factory foundries in the city of Chicago. These visits are a very important part of the course and the students are required to make written reports of them. Lectures are given on the location, arrangement and equipment of foundries, as well as on the materials used in making molds and castings.

The work in the pattern shop correlates the instruction given in the foundry and is designed to familiarize the student with working drawings from which patterns are made and to give practice in the care and uses of hand tools and patternmaking machinery. A special study is made of the methods of joining woods to prevent warping and exercises are given in planning and laying-out work and in the construction of typical patterns and core boxes, designed to demonstrate some principle and requirement necessary in the production of castings in the foundry.

In the forge shop the end sought is to impart a knowledge of the proper working of steel of different grades, also something about proper methods of heat treatment and above all, how to build a fire in a common forge and keep it under control.

One of the facts which has been prominently brought to light in connection with the experiments already made in co-operative education at Lewis Institute is the surprising amount of ground covered and work actually accomplished by the boys who are alternately in school and in the shop. It has been found that the co-operative boys cover as much ground in school as those who are in attendance constantly. This is due partially to the fact that vacations are shorter, but also because during the week they are in the shop the students have a chance to digest and assimilate the instruction which they received in the school during the previous week. Their progress is, therefore, rapid and steady.

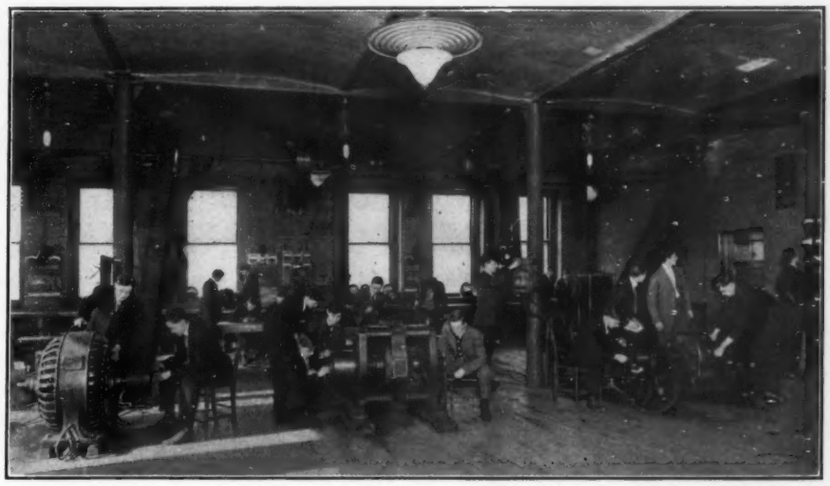


FIG. 6—THE ELECTRICAL LABORATORY, SHOWING THE STUDENTS TESTING MOTORS

Results Obtained.

In regard to the results achieved by this scheme of education, a few statistics regarding the class of 1910 will be interesting. In December, 1910, 20 boys completed the two years' work and at the commencement exercises in June, 1911, 17 who had satisfactorily completed the course of study were given school certificates. Six months after the completion of the course 14 of the 17 were still in the employ of firms with whom they had worked while students and the other three had been given the choice of remaining in active shop work, but were advised to find work where there were larger opportunities. The shop superintendents and employers who have had experience with the co-operative boys are a unit in strongly recommending the course of training which they receive. In one case an employer stated that some of the boys would be capable of acting as foremen in a small shop within a year after their graduation. At all events there can be no doubt that the efforts which Lewis Institute and the employers of Chicago are making in co-operative education marks a great step in advance of the methods of training shop apprentices.

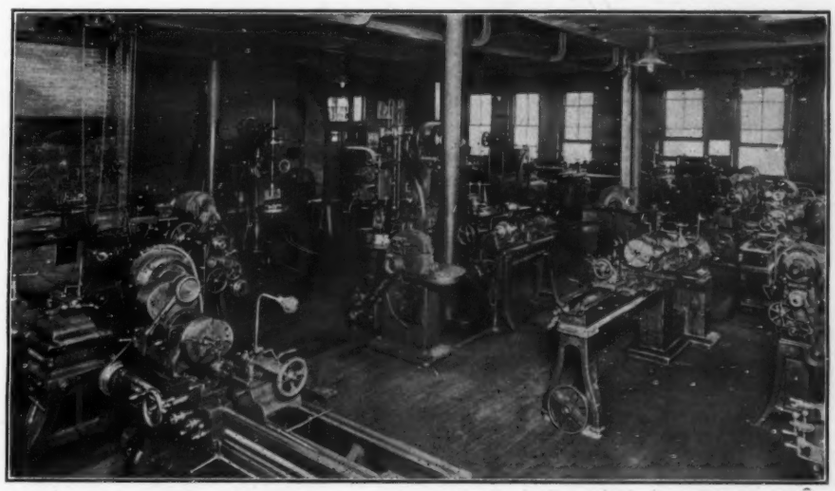


FIG. 7—MACHINE SHOP AT THE LEWIS INSTITUTE; ALL OF THE MACHINE TOOLS ARE DRIVEN BY INDIVIDUAL MOTORS

Atlas, Diesel Type, Crude Oil Engine

The Diesel type of crude oil engine has been the object of widespread interest in the engineering world for a number of years. Its remarkable fuel economy is probably not equalled by any other type of prime mover, and the announcement that the Atlas Engine Works, Indianapolis, is taking up its manufacture, embodying in the new machine some important improvements, mainly directed towards simplifying design and making all working parts accessible, is of interest. This concern is now building Diesel engines under the name of the Atlas crude-oil engine, up to 600-horsepower in size.

The distinctive features of this type of engine are, of course, its great economy and dependability. The simplicity of the Atlas design of this type of engine is notable. The entire valve mechanism is accessible from the outside. The only working parts in the crank case are the crank and connecting rod, thoroughly lubricated by splashing in an oil bath. The cylinder head can be removed without disturbing any of the valves or valve adjustment; all other adjustments can be made easily and quickly, most of them while the engine is in operation. The Diesel principle of fuel combustion is followed closely and there is no complication of parts. The fuel is controlled automatically and the amount used at half load is just about one-half that used at full load, with a high efficiency on the lighter loads. The makers state that the engine develops one brake horsepower on less than one-half pound of fuel oil of average calorific value and weight, which, figured at 2 cents a gallon, the present average price, would cost $1.35 per ten-hour day for 100 brake horsepower, or $2.00 per day for 100-kilowatts. The Diesel type engine, it is claimed, consumes about 45 per cent less fuel than a producer gas plant and about 80 per cent less fuel than a steam engine. It also does away with boilers and all fire room expense.

A test has recently been made on one of these machines by C. E. Sargent, consulting engineer, Chicago. The engine tested had two cylinders, 20 inches in diameter by 30 inches stroke, and was direct-connected to a 175-kilowatt generator. In the tests it showed an oil consumption of less than ten gallons per 100-kilowatt hours over a wide variation in load. The detailed figures are as follows: At one-quarter load, 12.73 gallons per 100-kilowatt hours; at one-half load, 9.73 gallons; at three-quarters load, 9.6 gallons; at full load, 9.27 gallons; at 25 per cent over-load, 10.15 gallons. The thermal efficiency at full load was 28.9 per cent.

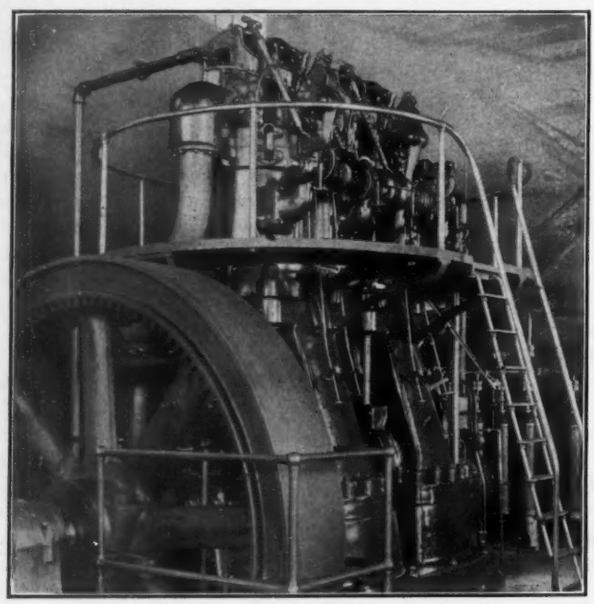


FIG. 1—VIEW OF THE ATLAS CRUDE-OIL ENGINE FROM THE FLYWHEEL END

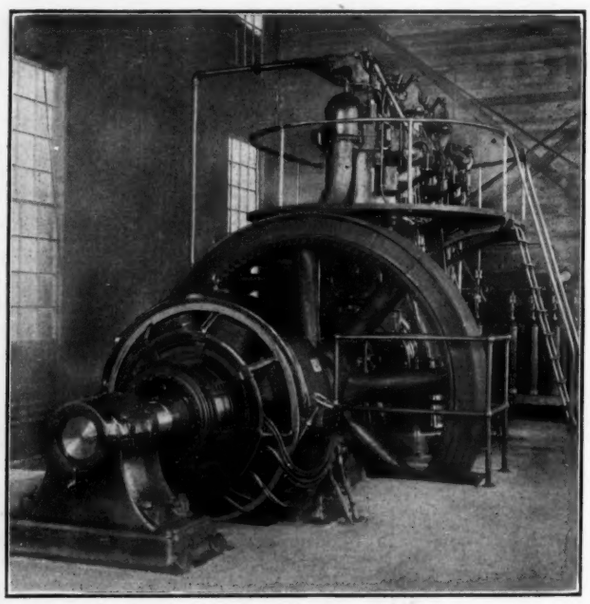


FIG. 2—ATLAS CRUDE OIL ENGINE DIRECT-CONNECTED TO A GENERATOR

The Oekling Co., of New York, has been incorporated to sell punching and shearing machines manufactured by Stahlwerk Oekling, of Dusseldorf, Germany, and has opened offices at 50 Church street. Large warehouses will be established shortly at Jersey City.

An Electrically Driven German Rolling Mill

At the steel works of the Georg-Marien-Bergwerk und Hutten Verein, in Germany, the mills are operated by electricity and the power is derived from a large gas engine generating plant, which utilizes the waste furnace gases as fuel. The mill is driven by two direct current shunt wound twin motors, of 7,000 horsepower, which are enclosed in a separate room, through the walls of which the driving shaft is extended and connected to the rolls. The motor generator set consists of four direct current machines, which operate at a speed of from 350 to 450 revolutions per minute, and which are protected from overloading by a large flywheel, which is mounted on the common shaft of the machines and gives up its energy to the dynamos at the time of the maximum torque of the rolling mill motor. The weight of this flywheel is 35 tons, and it travels at the rate of 295 feet per second. A special coupling had to be designed to connect the flywheel with the four machines.

That foundries generally are operating at increased capacity is indicated by the report of out-of-work stamps issued to the members of the International Molders' Union during the past three months. In July, 4,900 out-of-work stamps were issued; in August, 4,275, while in September the number was reduced to 2,975. This indicates a marked improvement in the degree of employment of molders since July 1.

IRON AND STEEL SECURITIES

Prices on the New York stock exchange last week moved to a generally higher level. Developments of the week were not of great importance and the market ruled quiet and undisturbed.

Monday, trading was fairly active, accompanied by small net changes in the greater portion of the list; cotton declined to a new low price. Tuesday was dull and price changes were insignificant; foreign security markets were equally listless. Wednesday, stocks continued dull with prices averaging higher at the close. Thursday the market was closed because of Columbus Day; foreign markets were firmer. Friday the market was dull but firm and prices closed higher. Saturday the shares closed strong and higher; October cotton went to lowest price of the year; plan for the dissolution of the American Tobacco Co. announced.

Call money again moved up to the usual range of 2½ to 2 per cent, while time money, in spite of slight concessions in terms, was in light demand. The actual condition of clearing house institutions showed loans decreased $1,296,000; net deposits increased $1,148,000; total reserve, $419,747,000; excess of reserve, $13,362,000, a decrease of $956,200, and the percentage of reserve 26.3, compared with 26 the week previous. Non-member banks and trust companies showed loans decreased $2,338,200; net deposits decreased $693,900; reserve on deposit increased $1,010,100; and the percentage of reserve 19.5, against 19.5 the week previous. Bank clearings showed a decrease of about 15 per cent from last week; the decrease from last year was less noticeable. Commercial failures were 241, compared with 212 the preceding week and 257 the corresponding week last year. Shares were sold to the number of 1,758,600, compared with 2,512,600 the preceding week and 2,704,150 the corresponding week last year. Bonds, exclusive of government bonds, were sold to the amount of $41,200,000, compared with $13,722,000 the preceding week and $12,805,000 the corresponding week last year.

	Closing Quo. Oct. 14	Changes in week	Annual Meeting date 1911	Stock Outstanding	Basis.	Dividend Last Dividend	Dividend Date Last Div. Pay
Allis-Chalmers	3	+1		$19,820,000			
Allis-Chalmers, pr	11¾	—1¼	Nov. 2	16,150,000	7 cum.	1¾ Q.	Feb., 1904
American Can	10¾	+ ¾	Feb. 1	41,233,300		1¾ Q.	
American Can, pr	86½	+2½		41,233,300	7 cum.	1¾ Q.	Oct., 1911
Am. Car & Fdy	49⅞	+2½	June 29	30,000,000		½ Q.	Oct., 1911
Am. Car & Fdy., pr	115	.....		30,000,000	n. c.	1¾ Q.	Oct., 1911
American Loc	35¾	+ ¾	Oct. 17	25,000,000	5	1¾ Q.	Aug., 1908
Am. Loc., pr	104⅛	— ⅞		25,000,000	7 cum.	1¾ Q.	Oct., 1911
American Ship	50	.....	Oct. 11	7,600,000	4	2 Q.**	June, 1911
American Ship, pr	106½	.....		7,900,000	7 cum.	1¾ Q.	Oct., 1911
Am. Steel Foundries	32⅜	— ⅛	Dec. 7	17,184,000		1 Q.	May, 1911
Barney & Smith	15	.....	June 6	2,000,000	4	1 Q.	Dec., 1907
Barney & Smith, pr	70	.....		2,500,000	8 cum.	2 Q.	Sept., 1911
Bethlehem Steel	28	.....	April 4	14,862,000		.....	.....
Bethlehem Steel, pr	56	—1		14,908,000	7 n. c.	¾ Q.	Feb., 1907
Cambria Steel	44	+ ¾	Mar. 21	45,000,000	5	1¼ Q.	Aug., 1911
Cambria Iron	44	.....		8,468,000*	4	2 S. A.	Oct., 1911
Chicago Pneumatic Tool	47	+1¼	Feb. 20	6,485,800	4	1 Q.	Oct., 1911
Colorado Fuel	27	.....	Oct. 16	34,235,500		1¾ Q.	Apr., 1902
Crucible Steel	10¼	— ¼	Oct. 18	24,578,400		3½ Q.	.....
Crucible Steel, pr	76	— ¼		24,463,500	7 cum.	1¾ Q.	Sept., 1911
Empire Steel	5	.....	Feb. 22	1,254,770		.....	.....
Empire Steel, pr	50	.....		2,500,000	6 cum.	1 S. A.	July, 1911
Fay & Egan	70	.....	Feb. 21	1,000,000	6 cum.	3 S. A.	Feb., 1911
Fay & Egan, pr	110	.....		1,000,000	7 cum.	1¾ Q.	Aug., 1911
General Electric	151¼	+2¾	May 9	65,179,600	8	2 Q.	Oct., 1911
Harbison-Walker	48	.....	Jan. 16	18,000,000		½ Q.	Sept., 1911
Harbison-Walker, pr	98	.....		9,600,000	6 cum.	1½ Q.	Oct., 1911
International Pump	27¼	— ¼	Dec. 12	17,762,500		1 Q.	Nov., 1910
International Pump, pr	81½	— ¼		11,350,000	6 cum.	1½ Q.	Nov., 1911
Lackawanna Steel	30	.....	Mar. 4	34,978,000		.....	.....
Lake Sup. Corp	27¾	+3¼	Oct. 4	40,000,000		.....	.....
New York Air Brake	54	.....	Mar. 8	10,000,000	6	1½ Q.	July, 1911
Niles-Bement-Pond	94	.....	Feb. 8	8,500,000	6	1½ Q.	Sept., 1911
Niles-Bement-Pond, pr	104	.....		2,000,000	6 cum.	1½ Q.	Aug., 1911
Otis Elevator Co	68	.....	Mar. 20	6,375,000	1	1 Q.	Oct., 1911
Otis Elevator Co., pr	95	— ½		6,310,000	6 n. c.	1½ Q.	Oct., 1911
Pa. Steel	60	.....	May 8	10,750,000		.....	.....
Pa. Steel, pr	105	—1		16,500,000	7 n. c.	3½ S. A.	May, 1911
Pittsburgh Coal	18	+ ½	Feb. 10	28,104,600		.....	.....
Pittsburgh Coal, pr	80	+1¼		27,071,800	7 cum.	1¾ Q.	Oct., 1911
Pressed Steel Car	28¼	— ¾	Feb. 15	12,500,000		1 Q.	Aug., 1904
Pressed Steel Car, pr	95	— ½		12,500,000	7 n. c.	1¾ Q.	Aug., 1911
Pullman	156	+1	Nov. 8	120,000,000	8	2 Q.	Aug., 1911
Railway Stl. Spring	28⅛	+ ¼	Mar. 2	13,500,000	2	1 S. A.	Oct., 1908
Railway Stl. Spring, pr	94	.....		13,500,000	7 cum.	1¾ Q.	June, 1911
Rep. Iron & Steel	22⅞	+ ⅜	Oct. 18	27,191,000		.....	.....
Rep. Iron & Steel, pr	85½	+2½		25,000,000	7 cum.	1¾ Q.	Oct., 1911
Sloss-Sheffield	40	+3	Mar. 15	10,000,000	5	1¼ Q.	Sept., 1910
Sloss-Sheffield, pr	112	.....		6,700,000	7 n. c.	1¾ Q.	Oct., 1911
U. S. Pipe & Fdy. Co	12⅝	+ ⅛	June 28	12,106,300		1 Q.	Dec., 1910
U. S. Pipe & Fdy. Co., pr	45	+4½		12,106,300	2	1¼ Q.	June, 1911
U. S. Steel	61⅛	+2⅜	April 17	508,302,500	5	1¼ Q.	Sept., 1911
U. S. Steel, pr	109⅛	+⅜		360,281,100	7 cum.	1¾ Q.	Aug., 1911
U. S. Steel 5s	102¼	+ ⅛		463,798,000	5	.....	.....
Va. Iron, Coal & Coke	60	—13	Sept. 19	9,073,680		5. †	Oct., 1907
Westinghouse Electric	63	+ ½	July 26	3,998,700*		1¾ Q.	Oct., 1911
Westinghouse Air Brake	143	— ½	Oct. 3	13,750,000*		5 Q. ‡	Oct., 1911

Par value of shares, $100, except those starred (*), $50.
**Includes last 1 per cent payment of 4 per cent extra.
†Stock.
‡Includes 2½ regular, 1½ extra and 1 special.

Copper Stocks.

New York.—Amalgamated Copper closed 52¼, a net gain of 3⅜.

Boston.—Butte Coalition closed 15, no change; Calumet & Arizona closed 49½, a net gain of ¾; Calumet & Hecla closed 390, a net loss of 9½; North Butte Mining closed 25, a net gain of ¾; Quincy Mining closed 60, no change.

Financial Notes.

The International Steam Pump Co. has declared the regular quarterly dividend of 1½ per cent on preferred stock, payable Nov. 1.

Henry R. Worthington, Inc., has declared the regular semi-annual dividend of 3½ per cent on the preferred stock, payable Nov. 1.

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THE AVERAGE PAID CIRCULATION OF THE IRON TRADE REVIEW FOR THE ISSUES OF THE FOLLOWING MONTHS WAS:

January, 1911	6,058
February	6,072
March	6,091
April	6,108
May	6,112
June	6,124
July	6,138
August	6,152
September	6,161

October 19, 1911

Our Increased Iron Production

Our statistics of September pig iron production, published a week ago, reflect the increase in iron production which has occurred in three months. The September production of coke and anthracite pig iron was at the rate of 65,620 tons a day, or at the rate of about 66,500 tons a day, including charcoal pig iron. The official statistics of production in the first half of this year showed a daily rate for the six months of about 64,000 tons. Thus the September production, while showing a gain of about 7 per cent over August, and of about 13 per cent over July, showed a material gain over the rate in the first half. A little computation will show that a slight further gain in the September rate, for the remainder of the year, will make a second half total materially larger than the first half total, despite the fact that the second half must bear the brunt of the summer period, when production is normally reduced.

Whether this increase is justified by demand is a serious question and judging from recent declines in prices on some grades of pig iron, the increased output was uncalled for and constitutes a menace to any progress upward from the present cost or below cost prices.

Slump in Ore Shipments

(From Daily Iron Trade Review.)

The lake season of 1911 has not been satisfactory to vessel owners. Not only has the volume of freight been less than for several years past, but the freight rates have been lower. Contract vessels have cared for most of the ore movements and the wild vessels have had very little to do. The fleets owned by the shippers have carried a greater proportion of ore than ever before, and the independent owner has had a sorry time of it. Every effort has been made to nurse the situation along in the hope of bolstering it up for the fall months, but apparently there is nothing left to bolster.

Vessel owners have pursued the same tactics that they did in 1909, but unfortunately the freight is not offering to support their maneuver. In 1909, the season opened very cautiously, vessel owners being reluctant to put their ships into commission early. It was June before the whole fleet was well under way, with the result that all of them had steady employment throughout the year. In 1910 the season opened with a rush, more ore being moved in April than ever before. The May movement was simply terrific for such an early month, but it became apparent that things had been overdone and in order to keep the market from going all to pieces, vessel owners deliberately retired one-fifth of their ships.

The present year opened as cautiously, if not more so, than 1909, many owners that had taken storage coal reserving the right to hold it until July, if need be; that is to say, they did not care to send their ships out to deliver the single cargo of storage coal unless there was a reasonable prospect of getting a return cargo of ore. The necessity for this caution had been acutely brought home to them in 1910 when they discovered that after retiring 20 per cent of their ships they never had the opportunity of getting them again into commission during the year, so great was the surplus of ships over cargoes, and that, notwithstanding the fact that the 1910 movement was the heaviest on record. Unfortunately for the vessel owner, 1911 has at no time exhibited much activity. It will be noted from the accompanying table that the movement of ore during 1911 has at no time equalled that of 1909 or 1910, and as few sales of ore are now being made there is no prospect of its equaling the monthly movement during the remainder of the year. The table follows:

	1909	1910	1911
May	3,253,275	6,081,358	3,684,819
June	5,393,255	7,316,592	4,826,505
July	6,693,025	6,945,289	5,221,373
August	7,193,199	6,964,381	5,548,311
Sept.	7,050,985	6,273,232	5,231,069
Oct.	6,625,801	4,877,441	
Nov.	4,899,220	2,641,886	
Dec.	5,519,525	.....	

The movement of ore to Oct. 1, 1911, is 24,337,137 tons, as against 35,100,864 tons for the corresponding period during 1910, a decrease of 10,263,727 tons. Were the fleet to move during the remaining months of the year as much ore as it moved last year, the total movement for 1911 would be approximately 32,300,000. There is no prospect, however, of any such movement, and it is doubtful if the total movement for the season will be much over 30,000,000 tons, which would make a decrease of 12,000,000 tons from that of 1910.

The one redeeming feature of the trade has been the movement of coal. This has been exceptionally heavy, exceeding even that of 1910, which was the heaviest on record. The coal

movement during 1910 was 22,838,700 tons, and this movement will be sensibly increased during 1911. There has been quite a demand throughout the year for coal carriers in small capacity to reach the lesser ports which have not draught enough to accommodate the larger class of carriers. Slight premiums have been paid for this kind of tonnage. Many of the large carriers which as a rule do not bother with coal, have been carrying it to the head of the lakes this year, so that the heavy movement has been handled with ease.

Basing Points for Steel Products

The appearance of quotations for certain steel products independent of prices ruling in the Pittsburgh market has no direct connection with the principle discussed several years ago that the United States Steel Corporation would be likely eventually to establish a separate basing point at Chicago on account of the erection of the Gary plant. The principle discussed at that time was of the formal establishment of a separate basing point, in a controlled market, whereby prices would be as systematically quoted f. o. b. Pittsburgh and f. o. b. Chicago, respectively, as they had formerly been quoted f. o. b. Pittsburgh alone. The market under that alignment would have been as steady and regular as under the single basing point.

The present market, on the other hand, is an irregular one, and the appearance of separate basing points is merely an incident in open competition, particularly marked by reason of prices having declined more closely to the level of production costs. There is really no system involved. At no time for several months has there been one clear cut market price for any of the leading commodities. In each case, there was one price for the ordinary carload buyer, with specifications not particularly attractive, another price for the more desirable orders, and still other prices for other orders, exceptional in their attractiveness. In such a market, one cannot directly compare Pittsburgh and Chicago prices, for the comparison could be made only with conditions identical as to the character of the orders upon which the prices were made. It has only been possible to observe, in a general way, that on this product or that product, when a particularly attractive order was under negotiation, it would be found regularly that the mills in the district would get the order and the mills in the other district would fail entirely to quote a sufficiently low price. In any market, moreover, prices have not stood still long enough to enable a full comparison to be made. Often they have declined from one week to the next.

What is really occurring is, as a matter of fact, a trend towards the naming of prices f. o. b. mill. As some very important mills are located in the Pittsburgh district, and a group of mills active in the market are located in the Chicago district, it frequently appears that prices are crystallizing around the cities named, when this is really only an incident of the trend towards the quoting of prices at mill. In the case of bars, there are at least three zones or districts, Pittsburgh, Chicago and Buffalo, and if some important steel bar producers were located in Cincinnati or St. Louis, for instance, those points would also appear as if they were basing points.

The impression has probably prevailed more or less that the system of basing prices on Pittsburgh had a direct and important cause in the alignment of cost of production; that in some way the cost of production increased more or less regularly and systematically as one receded from Pittsburgh. That is hardly the case at present. The chief cause of the single basing point at Pittsburgh was the tendency to have a uniform system of quoting delivered prices. To quote uniform delivered prices would have been artificial and impractical. To quote a Pittsburgh price plus freight would come nearer suiting actual conditions, but would still be some distance away from doing so.

The derangement of the price quoting system creates considerable disturbance. In the first place, it has a tendency to make the steel market weaker than it really is. For instance, a low delivered price named by a Chicago mill on steel bars is figured back to Pittsburgh, and the intimation may go out that a Pittsburgh mill is willing to name that price at its plant, when, as a matter of fact, it may not have been willing to name a quotation within $1 or $2 a ton of that limit, and thus the market is given an appearance of greater weakness than actually exists. Again, a given mill has built up a certain trade, and is willing to hold that trade by reducing its prices in accordance with the general decline. It finds, however, that certain portions of its trade, located near a competing mill, are being attacked and then it is confronted by the alternative of reducing all its prices, unnecessarily as to a portion of its trade, not thus attacked, or of establishing a double or multiple price system itself, whereby it will charge two customers of equal importance, located in different places, prices which will net different results at mill. Neither of these alternatives is a comfortable one, but if neither is adopted, a portion of the trade is lost. Again, there is disturbance to consumers of the finished steel products of the steel industry, as they in their turn have established markets for the sale of their finished products, in which prices prevail according to the old single basing system. With a new system established, or a period of continued change, their selling markets are disturbed and trade is likely to be lost.

Receiver Asked for Indiana Company

A receiver for the Atlanta Tin Plate & Sheet Metal Co., which has a plant at Atlanta, Ind., has been asked for by Henderson Coppock, of Indianapolis, and nine other persons, who have brought suit in the Hamilton county circuit court, at Noblesville, Ind. The plaintiffs claim that they hold 500 shares of stock and that the plant is being operated at a loss. The company is said to have assets valued at $250,000.

The American Ship Building Co. has secured contract from the Standard Oil Co., for the construction of an oil carrier to be 380 feet keel, 52 feet beam and 28 feet deep. The new steamer will be built on the Isherwood system of construction and will be the largest oil carrier on the lakes.

Machine Tool Builders Employ Paid Secretary

Next Annual Meeting Will be Lengthened to Three Days—Concluding Session of National Machinery Dealers' Convention

Several important actions which signalize the broad growth in membership and in influence and likewise in the volume of the business affairs of the organization marked the closing session of the annual meeting of the National Machine Tool Builders' Association at the Hotel Astor, New York City, Oct. 11. Authority was vested in the executive committee for the employment of a paid secretary, who shall give his entire services to the business of the Association throughout the year. It was also decided, owing to the press of matters presented for attention in the limited time of the two days' convention, that the period of the annual meeting be extended to three days and it was left to the option of the executive committee as to whether the semi-annual meeting should be similarly increased. These clear evidences of substantial growth and development appropriately were given final determination upon the decennial anniversary of the asociation's founding.

The election of officers was accompanied by the adoption of a resolution extending the association's thanks to the retiring administration for its efficient services.

The employment of a permanent salaried secretary was forcibly commended to the association by C. E. Hildreth, who, for the past two years, has so capably served the machine tool builders in that capacity as a volunteer officer. Mr. Hildreth emphasized the fact that the association had grown so rapidly that it was no longer possible for any secretary to properly discharge the duties of the office without giving his undivided time to that purpose. He predicted that great benefits would flow to the members of the association through a secretary who would come in personal contact with the members throughout the year. The proposition received general endorsement in the discussion and a resolution prevailed that the executive committee be empowered to select a capable secretary and to fix the salary of the office. In the discussion of the secretaryship the association paid its highest appreciation to Mr. Hildreth for the splendid services he had rendered as a volunteer officer and for the sacrifice of time that he had so cheerfully given in the performance of his accepted duties. It is the understanding of the association that the new secretary, when selected, shall co-operate with Mr. Hildreth for the first year and receive the benefit of the latter's instruction and experience.

Equipment for Schools.

Considerable discussion was given by the builders to the practice of making donations or of special prices on machine tools to trade schools and public institutions of mechanical instruction which had been followed more or less in the past. It was pointed out that many of these institutions are unendowed and dependent upon public support. Considerable difference of opinion developed as to what course the association should pursue in this connection and it was the opinion of the manufacturers that the rights of the dealers in this connection were also entitled to consideration. The question was finally left to a committee composed of Wood Walter, of the Cincinnati Milling Machine Co., Cincinnati; A. E. Newton, of the Prentice Bros. Co., Worcester, Mass.; and Murray Shipley, of the Lodge & Shipley Machine Tool Co., Cincinnati, which will confer with representatives of the dealers' association. The dealers, in their sessions, which were also being held in the Hotel Astor, had had this question up for consideration and had similarly selected a committee for conference with the tool builders. This committee is composed of W. M. Pattison, of the Wm. Pattison Supply Co., Cleveland; J. O. Harron, of Harron, Rickard & McCone, San Francisco; Alfred Marshall, of Marshall & Huschart, Chicago; R. J. Lynd, of the Chandler & Farquhar Co., Boston, and A. Schen, of J. W. Wright & Co., St. Louis.

On the subject of better shop hygiene and sanitation and the conservation of health and safety, the following resolution was adopted:

RESOLVED, that a committee be appointed to investigate the matter of human conservation and that this committee be authorized to confer with committees of other organizations engaged in similar investigations and with the National Conservation Congress and report from time to time.

Some discussion was given to the advisability of the association as a body accepting entertainment from the trade press and outside interests on any occasions before the conclusion of the business sessions of the convention. President Geier, while expressing his appreciation of the courtesies and hospitality involved in such entertainments, stated his belief that the best interests of the association would be served by deferring such functions until after the association had transacted its business. The matter was finally left in the hands of the executive committee. Some of the members favored the printing of the papers to be presented and their distribution among the membership, in advance of the convention, that the discussions might be more complete and beneficial. It was explained that this was a matter within the province of the executive committee and that this might be done in some cases but that it was not always possible.

Five new members were admitted to the association at the concluding session, as follows: The Cleveland Punch & Shear Works Co., Cleveland, O., Edwin E. Bartlett, Boston, Mass., Hilles & Jones Co., Wilmington, Del., H. B. Underwood & Co., Philadelphia, Rowbottom Machine Co., Waterbury, Conn.

Atlantic City was picked as the

New Officers of National Machine Tool Builders' Association

President—E. P. Bullard, The Bullard Machine Tool Co., Bridgeport, Conn.

First Vice President—F. A. Geier, Cincinnati Milling Machine Co., Cincinnati.

Second Vice President—A. T. Barnes, W. F. & John Barnes Co., Rockford, Ill.

Treasurer—A. E. Newton, Prentice Bros. Co., Worcester, Mass.

Secretary—C. E. Hildreth, Worcester, Mass.

place for holding the semi-annual spring meeting, the hotel and dates to be announced later.

Dealers Conclude Meeting.

The convention of the machinery section of the National Supply & Machinery Dealers' Association, which was also held at the Hotel Astor at the time of the meeting of the manufacturers, was concluded Wednesday evening. The Wednesday program included the discussion of the following subjects: "Best Methods of Handling Sales to Trade and Technical Schools and Other Similar Institutions," by Percy M. Brotherhood, Manning, Maxwell & Moore, Inc., New York; "Scientific Analysis of the Cost of Distributing Machine Tools," by Anton Vonnegut, Vonnegut Machinery Co., Indianapolis, Ind.; "Service Rendered to Appraisal Companies in Connection With Appraisal of Machine Tools and Other Equipment", by W. R. Colcord, W. R. Colcord Machinery Co., St. Louis, Mo., and "Uniform Proposal Blank", by Percy M. Brotherhood, Manning, Maxwell & Moore, Inc., New York.

The machine tool manufacturers and the dealers were the guests Tuesday evening at the ninth annual entertainment of *Machinery*, which was given in the grand ball room of the Hotel Astor. On Wednesday evening, they were tendered a theater party at the New York Hippodrome by the *American Machinist*.

Quarterly Lackawanna Steel Report

The report of the Lackawanna Steel Co. and subsidiaries for the quarter ending Sept. 30 last, follows:

Total earnings	$799,936	Dec.	$640,213
Interest	437,500		.....
Balance	362,436	Dec.	640,213
Deductions	322,366	Dec.	87,928
Surplus	40,070	Dec.	552,285
Nine months, Jan. 1 to Sept. 30:			
Total earnings	$2,406,297	Dec.	$2,482,196
Interest	1,312,500	Inc.	20,417
Balance	1,093,797	Dec.	2,502,613
Deductions	946,153	Dec.	363,921
Surplus	145,644	Dec.	2,138,692

The unfilled orders on Sept. 30 amounted to 189,898 tons gross, against 261,931 Sept. 30, 1910.

Wire Rope Works.—Excellent progress is being made by the contractors in charge of the construction of the new plant of the McComber, Whyte Co., of Chicago, which some time ago decided to move its wire and cable works from Chicago to Kenosha, Wis. The plant will be one of the largest wire rope manufactories in the country.

TOPICS SELECTED

For Winter's Series of Meetings by Pittsburgh Foundrymen.

The program committee of the Pittsburgh Foundrymen's Association, of which Eliot A. Kebler, of M. A. Hanna & Co., is chairman, at a recent meeting outlined an interesting program for a series of meetings to be held during the winter. The program is as follows:

November meeting: Prof. J. J. Porter; "Quality of Pig Iron, Its Independence of Chemical Composition and Its Relation to Methods of Manufacture."

December meeting: B. J. Goodin; "Coke Districts;" W. E. Weinn and Harvey Cory, "Coal Washing Machinery for Coke Manufacture."

January meeting: "Practical Demonstration of Different Methods of Welding." Meeting to be held in the foundry of the Carnegie Technical Schools.

February meeting: Joint meeting with the Pittsburgh Foundry Foremen's Association. Subject; "Brass."

March meeting: Subject; "Steel."

April meeting: Subject; "Mechanical Appliances in the Foundry."

May meeting: Subject not assigned.

June meeting: Dr. Richard Moldenke, secretary of the American Foundrymen's Association, and H. E. Field, of Pittsburgh; "Molding Sands." This will be the annual meeting of the Pittsburgh Association.

Difference of Opinion Among Committeemen

The international committee of steel makers appointed as a result of the July conference in Brussels, has met, but has not come to any agreement, and some dissension is said to exist between its members, according to our Birmingham, Eng., staff correspondent. This is the condition of affairs that was predicted by conservative British steel-makers last summer following the conference.

The steel makers of the north of England and Scotland have had a conference to consider the proposed granting of rebates to consumers as a means of meeting foreign competition, but failed to agree, the difference of opinion mainly relating to the methods of operation.

Rebuilding Mills.—The Ninth street mill of the Reading Iron Co., Reading, Pa., is nearly completed and the plant, which has practically been rebuilt, is in operation in every department. Work has also been started on the company's new No. 5 mill on South Seventh street, which will be similar in construction to No. 6 mill at the corner of Seventh and Laurel streets.

Will Enlarge Foundry and Machine Shop

The American Brass & Iron Co., Detroit, has let a contract to Allen & Hill, that city, for the construction of a brick foundry, 35 x 80 feet, which will triple the present capacity. The structure, which will be of the monitor type, will be furnished with a fireproof metal and pattern vault. Covered spaces will be provided for coke, sand, charcoal, etc., while arrangements have been made for shower baths and other conveniences for the workmen. It is expected that the building will be ready for operating by Dec. 1, when the company will be in a position to furnish brass, bronze or aluminum castings, either rough or machined. The J. D. Smith Foundry Supply Co., Cleveland, will furnish the furnaces for the new foundry and also the steel work for the pit. The company, at the same time, will enlarge its machine department.

Will Consider Machinery Suggestions

The Vilter Mfg. Co., Milwaukee, advises that it will erect a building, 120 x 270 feet, to be equipped for machining, bending and assembling of pipes to be used in connection with ice-making and refrigerating installations. The new building will be located on a site with a dock frontage of 675 feet on the Kinnickinnic river and which is across the street from the present plant. The Vilter company will be glad to consider the installation of machinery which will decrease the cost of production.

The Wisconsin Wire Works, Appleton, Wis., advises that it is erecting a two-story cement addition, 41 x 41 feet, in which it is installing two wide looms and two winders, this equipment to be added to later. Electric power will be used exclusively. The addition is nearly ready for the installation of machinery.

R. A. Babcock & Co., Providence, Ky., have bought the machine shop of W. I. Garrett, in that city.

Remarkable Results of Inquiry Into Metallurgy

Steel's Transformations, Carbon's Effect on Alloys and Temperature Influences Discussed Before British Institute

The usual statutory meeting of the Iron and Steel Institute, substituted for the abandoned Turin meeting and tour, was held at the Institution of Civil Engineers, London, on Oct. 5, the president, the Duke of Devonshire, in the chair. As previously announced by the council, the meeting at Turin, which would have coincided with the holding there of the International Exhibition, and in connection with which an elaborate tour of visits to the principal steel works and places of historic interest had been arranged, had to be abandoned at the last moment. The explanation given by the council included the numerous withdrawals of members, chiefly owing to the labor unrest, the dread of the Italian plague and the disturbed condition of Europe.

The number attending the meeting proved somewhat unexpectedly large, about 100 members being present. The president, in opening the proceedings, said that it would be a matter of great regret to members of the institute that the council had to arrive at the conclusion to postpone or defer the visit proposed to be made to Italy. A letter had been addressed to the president of the association in Italy, J. E. Falck, expressing the regret of the institute, and a further resolution was proposed thanking the hosts for the trouble taken, and the efforts made to give the visitors a thoroughly warm welcome.

It was announced that the following vice presidents and members of the council would retire in rotation in May next, in accordance with rule 10, and would be eligible for re-election: Vice presidents W. Evans, Dr. J. E. Stead and Sir John G. N. Alleyne, Bart.; members of council, W. H. Hewlett, C. P. E. Schneider, W. H. Ellis, C. J. Bagley and J. H. Darby.

The first paper was by L. Grenet, of Paris, entitled "The Transformations of Steel Within the Limits of the Temperatures Employed in Heat Treatment." Extracts having been read by the secretary, Sir Robert A. Hadfield, of Sheffield, opened the discussion. He refrred to the remark that "such rapid cooling does not occasion variations in the hardness," and this observation should be taken with that on another page where the author said, "It may, however, be said that in the few instances, in which such quenchings are known, the quenched state is often softer than the annealed state." He confirmed this statement from his experience with manganese steel. If manganese steel were heated and then quenched it would not increase the hardness, which would be slightly less than before. That was a remarkable fact, taken in consideration with the fact that the sample steel had been heated nearly to the melting point of copper; steel containing 1.20 per cent of carbon and heated up to a high temperature, say 950 to 1,050 degrees, was really slightly softer at the end of such treatment.

Rivals Get Together.

Professor Arnold, of Sheffield, said it was a matter of congratulation to find how nearly the rival schools of thought were now coming together, especially when they remembered the hopeless differences of opinion which had prevailed in the past. M. Grenet had said: "Martinsite may just as well be regarded as a very fine aggregate of two (cementite and ferrite) or sometimes three (cementite, ferrite and solid solution) constituents, as also as a homogeneous constituent." It was well known in the institute that that was the view which Sheffield metallographists had taken from the first, that the so-called martinsite was not a constituent at all, but a general structure. If they cut a piece of steel casting containing 1.4 per cent of carbon, and which was, therefore, very hard, they would find largely developed a martinsitic structure and in that case it would be lined out in cementite. The speaker gave other particulars to prove, as he stated, that there was no such constituent as martinsite, but that it was a structure.

Dr. J. E. Stead, of Middlesbrough, said that he quite agreed that the paper should be specially considered by those who elaborated theories and invented terms, and he thought Professor Howe, of New York, and Professor Le Chatelier, and some others of the same school, should be asked to contribute to the discussion. They had taken part in the discussion on the transformation of steel, and were foremost in the ranks of metallurgy. In particular, it was noticed that different terms had been used by M. Grenet in substitution for those previously employed. For instance, he talked of the "hot stable state," meaning something described by Howe and others as austenite, and the "cold stable state," which had generally been described by others as the "alpha" condition. They had not sufficient definition as to what that transformation really was, M. Grenet's statement being: "So far as the real cause of hardening is concerned, it cannot be said to be known." Here, remarked Professor Stead, they had been discussing this question for 20 or more years, and the last pronouncement was that they knew absolutely nothing about the hardening of steel. They all agreed that it was associated intimately with the critical change. They knew quite well that before it was quenched they had no hardness—the material was soft. The question whether the material was hard appeared to depend upon whether the quenching took place at above or below the temperature connected with the critical change. It was difficult to follow the reasoning of the author, because so many new terms had been introduced, but he quite agreed that they should go into the matter much more fully before they came to any dogmatic conclusion.

Explanations Differ.

Dr. Rosenhein, of London, said it was clear from M. Grenet's conclusions that his explanation of hardening differed very widely from those accepted either by French workers, or those in this country. M. Grenet said that the hardening was due to the fact that the transformation occurred very rapidly. But that was a point which required a good deal more than statement; it required a great deal of proof. There appeared to him to be no justification for the statement by the author that "there was no necessity to complicate matters by referring to the allotropic transformations of iron." That appeared to imply that he was able to explain hardening without reference to those allotropic transformations. He had similarly ignored what were known as the "alpha" and "beta" changes, and it was quite clear that the magnetic changes were not the only ones to be taken into

consideration. Most people are agreed that the transition products found in steel were the result of quenching of a more or less imperfect character.

At this stage, the president announced that 49 candidates for membership had been elected as the result of a ballot.

The next paper read was by Professor Arnold and F. K. Knowles, respectively professor and lecturer of metallurgy at the University of Sheffield, on the subject of "The Mechanical Influence of Carbon on Alloys of Iron and Manganese." Sir Robert Hadfield said he did not want to blow the horn of Sheffield, but it was his firm conviction that there was no place where these alloys could have been produced, except in that particular laboratory at Sheffield. Personally, he had studied alloys for many years, and he congratulated Professor Arnold most heartly on having been able to produce such an excellent series of manganese alloys with such a low carbon. When he first experimented with manganese alloys there was not in existence pure manganese. Manganese steel owed its properties, not only to the manganese present, but also to the carbon, so that they were indebted to carbon for being able to produce an alloy of such practical commercial value as manganese steel. Professor Arnold had been kind enough to furnish him with a number of the specimens referred to in the paper, and he hoped he would forgive him for having submitted them to tests and experiments. He took a series of those having a low carbon content, and some with high carbon, and after heating them to 1,000 degrees, Cent., he had quenched them in water and obtained certain results which might very well be added to the paper. He thought the figures showed the remarkable influence of manganese present with very little carbon. On the whole the results confirmed in a remarkable way those of his own alloys tested some time ago.

With 1 per cent of manganese they had hardness number of about 90, which represented the softness of pure iron and of Swedish charcoal iron.

They also bent several of the pieces, and with the one giving 143 as the measure of hardness, the sample bent double and broke. As a rule the hardness number followed toughness and ductility. The first four specimens on the list would bend very little, but when they reached 10 per cent of manganese they obtained a bend of 82 degrees, while with the last two specimens they bent them double, without breaking, showing the remarkable toughness of the material. It was clear that they had a great deal more to learn with regard to the structure of steel, and while they thought they knew a great deal about it, he believed they were really only on the verge of discoveries.

Need of Knowledge.

Dr. Stead said it was work of that kind, of which they wanted a great deal more, before they began to try to consider what were the conditions of iron when in an annealed state, and also in a hardened condition.

Quite recently he had examined a series of steel of the austenite type produced by quenching cementing bars from Sheffield, containing only iron and carbon, the latter being in the proportion of 1.5 per cent. Apparently, some of the differences in hardness were due to the presence of carbon, and to the austenite state being retained by hot quenching.

The last paper read was one by E. Adamson, of Sheffield, on the subject of "Temperature Influences on Carbon and Iron." Dr. Stead, in opening the discussion, said that the paper might be considered to be an attack upon analysts, and especially an attack upon those who had depended too much upon the determination of silicon in pig iron. He thought those who had anything to do with the foundry knew perfectly well that the analysis and determination of silicon was a most important thing. If they took a No. 1 pig iron and fractured it, it might have only 0.5 per cent of silicon, but when they had put it in the cupola they did not get No. 1, but they got a white iron. Silicon helps the founder considerably by letting him know what will happen. When he melts his iron, the character of the silicon fracture becomes very important, and if they have 2 per cent of silicon they might be quite certain that there was a lot of sulphur there—that is, presuming the pig was cast in ordinary sand. If they took a No. 4 pig iron and ran it into a bar half an inch thick, they might get a No. 1 quality, but if they took a No. 4 fracture it would be the same as No. 1 in quality. The rate of cooling has a very great influence. They could not depend upon fracture altogether, and he quite agreed that it was not desirable to depend upon the silicon. It was very much better to take into consideration the phosphorus and sulphur, as well as the total carbon, which has a very great influence on the strength of the iron. If they had too much carbon the iron would be weak, and it was desirable to reduce it to some extent. The practice of analysis in the foundry had proved to be very important, and analysis had enabled the founder to make use of irons which were once thought to be useless, and very good results had been obtained by mixing special brands.

The analysis would have a much more valuable and important position in the future, and it was a very good thing that that question of grading of pig iron should be brought up from time to time, so that they might see exactly where they stood. They could not judge the iron exactly either by the amount of silicon or by analysis. Analysis plus fracture was the most desirable thing.

E. Adamson, replying, said he thought Dr. Stead had slightly misunderstood his paper when he said that he was attacking the chemists. The chemist was a very valuable man to the ironfounder, because he enabled the latter to use iron which otherwise would be impossible. What he was attacking was the practice of grading by analysis pure and simple. He said he was regularly getting good results, embodying transverse tests and tensile tests, with a proportion of silicon from 1 per cent to 3 per cent. It was said that the sample referred to was a "freak"; but he had made refined iron containing 0.4 per cent of silicon and 0.5 per cent of silicon, and as to its being a "freak" he was ready to do it any day.

Only British Cloud.—The only real cloud on the British iron and steel trade horizon is the threat of a coal strike, as the men and their employers seem to find agreement impossible in regard to several more or less serious differences, especially in respect of the demand for a minimum wage and the payment for what are called abnormal places, says our Birmingham, Eng., staff correspondent. Consultations have taken place for three days now without satisfactory result. Both sides are anxious to avoid hostilities. In anticipation there has been some heavy buying of coal.

Nicholas Remmel, of Kewaskum, Wis., has completed the work of remodeling and enlarging his machine shop. A large Fairbanks-Morse gasoline engine has been installed and a number of new machine tools added. In addition to doing a general machine and repair business, Mr. Remmel manufactures cement workers' tools and castings.

Tax Valuation on Ore Land Proves Amazing

Specific Instances of Tremendous Advances Are Noted—Very Few Reductions—Summary of Owners' Arguments and Commission's Conclusions

Marquette, Mich., Oct. 17.—Compared with the figures of the local assessors, the valuation of the iron mines of Michigan has been given an amazing increase by the state tax commission. Compared with the appraisal made under legislative authority by J. R. Finlay, consulting engineer, of New York City, assisted by Professor C. K. Leith of the University of Wisconsin, the valuation as now finally and definitely established shows a very considerable decrease.

After a week of hearings, conducted at Bessemer, Crystal Falls, Iron Mountain and Marquette, the tax commission placed the valuation of the Michigan mines on the Marquette, Gogebic and Menominee ranges at $85,637,500, an increase of $66,011,492 over the aggregate valuation of $19,626,008 as figured by the local assessing officers, but a decrease of $33,512,500 from the Finlay valuation of $119,150,000. Apportioned by counties, mining property now stands assessed as follows: Marquette, $34,800,000; Gogebic, $28,343,100; Iron, $15,046,900; Dickinson, $7,447,500. The former assessments were: Marquette, $8,951,050; Gogebic, $4,943,158; Iron, $1,993,500, and Dickinson, $3,738,300. In the case of Marquette county, the new valuation is four times greater than the old; Gogebic, five and one-half; Iron, seven and one-half, and Dickinson, just twice as much as the former figure.

Few Reductions.

Of a total of 101 mining properties, 33 of which are in Marquette county, 37 in Iron, 18 in Gogebic and 13 in Dickinson, the figures of the local assessors were reduced by the state tax commission in only four cases. The American mine, Marquette range, is put on the rolls at $115,000, instead of $150,000; a Steel Corporation property at Bessemer at $200,000, instead of $230,700, and the two properties of the Pewabic company at Iron Mountain, Menominee range, are assessed at $16,000 and $284,000, instead of $40,000 and $705,000, respectively.

There are some particularly notable increases. An undeveloped property of the Jones & Laughlin ore company in the Iron River field goes up from $300 to $450,000. One Breitung company property at Negaunee is raised from $12,000 to $560,000; a United States Steel Corporation holding in the same district, from $9,500 to $255,000; a Cleveland-Cliffs company tract at Negaunee, from $1,950 to $474,000; another one of the same interests, in the Swanzy field, from $9,100 to $458,000. On the Gogebic range, the Steel Corporation's Norrie group at Ironwood is given a valuation of $14,651,000, compared with former figures at $1,800,600; the Newport mine of Ferdinand Schlesinger is increased from $1,471,061 to $8,535,000; Pickands, Mather & Co.'s Sunday Lake from $65,000 to $1,071,000; and the same interest's Brotherton property, from $100,000 to $954,000. On the Menominee range, one property of the Rogers-Brown interests in Bates township, Iron county, is assessed now at $310,500, an increase from $7,500; the Mineral Mining Co.'s James mine at $623,000, an increase from $75,000; the Spring Valley company's Zimmerman mine at $481,000, an increase from $60,000; the Caspian and Baltic mines of Pickands, Mather & Co. at $6,469,000, an increase from $536,000; and one of the Crystal Falls properties of Corrigan, McKinney & Co., at $1,195,000, an increase from $135,000. The Steel Corporation's Chapin mine at Iron Mountain is raised from $1,580,000 to $3,911,000, and its Aragon mine at Norway from $261,000 to $578,000.

As was to be expected, the Finlay report was the center of attack by all the mining men. Admitting generally that the method by which Mr. Finlay arrived at his calculations in fixing the aggregate valuations of the mines at $119,150,000 was reasonable, all of the companies contended that the results obtained by Mr. Finlay should not be arbitrarily taken as the basis of assessments of individual properties for taxation purposes. This contention was based upon the following arguments:

First:—In figuring the amount received for ore, Mr. Finlay based his calculations on the average price for the last five years, which results in an average higher selling price per ton than would have been obtained if the average for the last 14 years had been taken as a basis for finding the probable selling price of ore during the next five years.

Second:—The assumption that the mines will continue to produce at the rate they are producing is wrong, because circumstances and conditions at all the mines do not warrant the assumption they can continue to produce at the rate Mr. Finlay had estimated.

Third:—Mr. Finlay placed a higher per ton value on ores in the ground than the mining companies estimate they are worth, a value which was considerably higher than the Minnesota tax commission has placed on the same grade of ore in the ground.

Fourth: — The time allowed Mr. Finlay to make his investigations and calculations was altogether too short to do justice to the magnitude of the work involved.

Fifth.—Mr. Finlay assumed that 5 per cent is a fair return on the investment in mining property, whereas no investor would touch a mining proposition that was not reasonably certain of paying at least 10 per cent.

Sixth: — In individual instances, clerical errors had been found which resulted in a difference of thousands of dollars in the final valuations.

Seventh:—Other than mining property in the mining districts is assessed at not more than one-third of its actual cash value, and it would be manifestly unfair to assess the mines at 100 per cent of their value without raising other property to its actual cash value.

Commission's Conclusions.

In summarizing the conclusions reached by the state tax commission, President Robt. H. Shields, of Houghton, said:

There was no essential disagreement on the proposition that the Finlay valuation of the iron mines of Michigan as a whole, or of the several districts as a whole, is not excessive. But when it comes to distributing this value specifically among the mines, it involves assumptions as to the extensions and life of the individual mines, which might not be justified in the individual cases. To illustrate: The sum of the values of 25 mines comprising a district is probably short of the total value of the district, because of the large probability of extensions of ore beyond the present mines, and because the future deficiency of one mine will

be compensated by excess in another.

The most vigorous discussions, therefore, waged around the tonnage estimates and expectations of life of individual properties. A considerable number of companies made no protest along this line, accepting the appraiser's estimate. Others made claims for large reductions. Mr. Finlay anticipated this in his report, when he said that "the range of error lies in the mere extension of life that I have adopted as reasonable, beyond what is plainly measurable." The tonnage estimates adopted by the commission in this assessment represent a reduction from those in the Finlay report and are meant to cover a large part of this range of possible error. In other words, the commission has taken off a greater part of the tonnage assumed for the future by Mr. Finlay, over and above that originally estimated by Dr. C. K. Leith, as being either developed or immediately probable ore, which, in turn, averaged about 30 per cent in excess of those furnished by the companies themselves.

The valuations based on these reduced estimates of tonnages were reduced by a reasonable percentage as a margin of safety to cover future conditions which may fall short of the promise based on past performance of the mine, such, for instance, as lowering the grade of ore, increased cost of mining, lower selling price of ore, and, especially, increased taxes, it being plainly evident than an increased assessment will result in increased taxes, consequently greater cost and less profit and a lower valuation of the property.

Most of the mining companies have accepted the method of appraisal used by Mr. Finlay. The reduction of tonnage estimates would seem to eliminate the principal objection of the mining companies. The further reduction as a margin of safety against future hazards eliminates many of the objections to the detailed figures used by Mr. Finlay in calculating the future performance of the mines. The net result is a fair cash valuation which the commission regards as established beyond serious question.

In only one instance is the local assessor's valuation retained by the tax commission. This is in the case of Pickands, Mather & Co.'s Hemlock mine at Amasa, Menominee range, which remains on the assessment roll at $68,000.

Suits Dismissed

The United States circuit court of appeals at Philadelphia dismissed four suits on Oct. 11 brought by the Friederich Krupp Co., Germany, against the Midvale Steel Co., Philadelphia. The suits were based on alleged infringements by the latter on patents controlled by the Krupp company in connection with an armor plate manufacturing process. The decision, that the evidence was not satisfactory, sustained the previous decision.

NEW OFFICERS

Of Ashland Steel Co. Chosen by Directors.

Reorganization of the Ashland Steel Co., Ashland, Ky., due to the recent death of I. A. Kelly, president and general manager, was made by the board of directors at a meeting held a short time ago. The following officers were elected: President, B. H. Burr, of Ironton, O.; vice president, T. M. Adams; secretary, Oscar Richey, of Ironton; treasurer and general manager, L. R. Putnam. Mr. Burr, the new president, was formerly secretary of the company. Mr. Putnam, who has been treasurer, has also been made general manager. No changes in the general business policy of the company will be made.

Steel Institute Calls Special Meeting

The board of directors of the American Iron and Steel Institute has called a special meeting of the members of the institute to be held on Oct. 26, at No. 30 Church street, New York City, for the purpose of voting upon the following: First, a proposition that the number of directors of the institute be changed from 15 to 21; and second, a proposition that section 4 of the constitution of the institute be amended to read as follows:

Section 4.—The institute shall be managed and controlled by a board of directors consisting of 21 members in the manner and subject to the provisions of the constitution and the by-laws of the institute; the directors to be elected as provided in the by-laws, and, if so provided in the by-laws, to be divided into separate classes.

Crane Contract

The bureau of yards and docks, navy department, Washington, D. C., has awarded the contract for building the floating cranes for Boston and Pearl harbors, Hawaii (one each), to the Wellman-Seaver-Morgan Co., Cleveland, on its bid of $617,000, opened June 3.

Will Buy Crane

The Luitwieler Pumping Engine Co., Rochester, N. Y., advises that it is erecting a two-story factory, 65 x 134 feet, of brick, steel and concrete. Part of the upper floor will be used for office space and a balcony will be provided for assembling light machines and motor fire apparatus. A traveling crane will run from the main building into the new structure, serving both the balcony and the ground floor of the latter. No machinery will be required as the machine work will be done in the main building; the crane will be the only machinery purchase necessary.

Labor Conditions of Steel Corporation

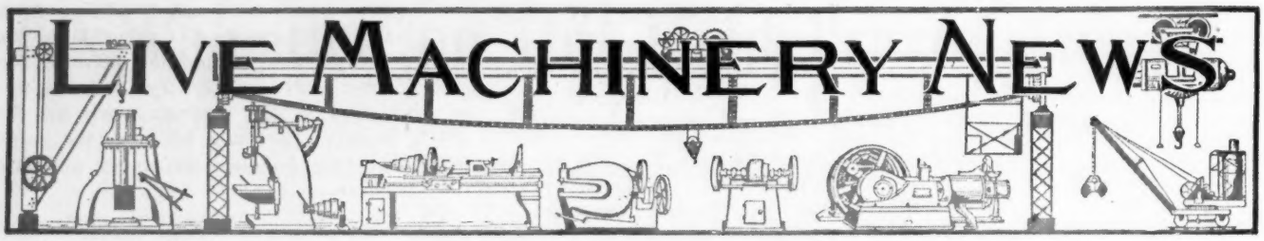
Charles M. Cabot, of Boston, a stockholder of the United States Steel Corporation, is more or less patiently awaiting the report of the Corporation on his resolution submitted at the annual meeting last April, which provided that an investigation be made as to the truth or falsity of criticisms of labor conditions in the steel industry by a certain magazine. The report was supposed to be made Oct. 1. On this point Judge Gary has issued the following statement:

The committee was named soon after the annual meeting. Some of the appointees accepted, others declined. I have had some difficulty in securing a committee of good men, as considerable work is involved. The full number has lately been obtained and has been requested to organize, and I believe they will do so within a short time and on the return of one of the members who is away from home. So soon as the committee is organized I will give out the names. The above information was communicated to Mr. Cabot some days since. There has been no unnecessary delay.

Foreign Rail Sales

New business continues very scarce in the steel rail department, but there is some hope of a very big line being required at an early date for one of the colonial markets. It is much to be desired that this business should come to its natural source of supply—the British manufacturer—as it undoubtedly would do more frequently than is the case were it not for the rail "ring," whose operations too often lead to British colonial business going to the foreigner. A small order—2,500 tons—for the Madras & Southern Mahratta railway has been booked by the Barrow Hematite Co. The United States Steel Corporation are credited with having taken a 10,000-ton order for Chili, and the Illinois Steel Co. with having secured a 25,000-ton line for the Canadian Pacific railway; while 5,000 tons for Japan have also been taken by American mills.—*Ironmonger*, of London, Oct. 7.

The Universal Oil Co., of California, will build an extensive pipe line from Lost Hills to tidewater.



Machine Tools

The Singer Mfg. Co., 149 Broadway, New York, recently purchased about 20 machine tools in the New York market, for installation in its Bridgeport, Conn., plant.

Merrick & Randall, architects, Syracuse, N. Y., have prepared plans for a vocational high school to be erected for the city of Syracuse. The estimated cost of the structure is $278,451. Machinery requirements include power equipment, metal and wood-working tools.

Moritz Goldstein, Berlin, Germany, with New York headquarters at 735 Broadway, has made some purchases of second-hand machine tools. Bids have also been submitted on a large number of used machines, which, if closed on, will be shipped abroad by Mr. Goldstein for resale in the foreign markets.

In addition to the small list of machine tools closed on by the Delaware, Lackawanna & Western Railroad Co. recently, other orders have been placed by that road involving from $6,000 to $8,000 for equipment for the Scranton shops. The company has also sent out specifications on approximately $20,000 worth of tools, and other machinery, to be acted on at an early date.

Water Works

The director of public service, Cleveland, will receive bids until Oct. 24, for pumps for fire service pumping station.

The Livermore Water & Power Co., Livermore, Cal., is preparing to install a modern electric lighting system at Sunol, Cal.

Dietrich & Goetz, Tucson, Ariz., are planning the installation of several electrically-driven pumps for irrigation purposes.

Bids will be received until Oct. 24, by E. W. Van Norman, village clerk, Monticello, Wis., for one triplex power pump, belt driven, to operate against static pressure of 67 pounds. Capacity must be at least five gallons per one revolution of the crank shaft. W. G. Kirchoffer, Madison, Wis., is the engineer.

Bids will be received until Oct. 23 by the borough of Aspinwall, Pa., for tools, material and the construction of a reinforced concrete reservoir and for tools, material and the construction of a 35,000-gallon cypress water tank. A. G. Shaw, Magee building, Pittsburgh, is the engineer in charge and S. R. Chase, borough clerk, Aspinwall, Pa.

A. T. Maltby, 20 West Jackson boulevard, Chicago, has been commissioned to prepare plans and specifications for the proposed new waterworks for the city of LaCrosse, Wis., to cost approximately $275,000. Preliminary estimates are: Pumping machinery, $40,000; cast iron water mains, $70,000; well system water supply, $35,000. Contracts will be awarded after Nov. 1.

Power Plant Equipment

Milville, N. J., will decide at the November election on the construction of a municipal lighting plant.

The city of Stockton, Cal., will vote on the establishment of a municipal electric lighting plant on Nov. 9.

Collinsville, Okla., has voted $45,000 worth of bonds for erecting a light and power plant.

Plymouth, Wis., will issue $20,000 worth of bonds for rebuilding the electric light plant.

Chicopee, Mass., is planning to improve its lighting system. The improvements will cost about $100,000.

Littleton, Mass., has authorized the issuance of bonds for the installation of a light plant and waterworks. The estimated cost is $65,000.

Waco, Tex., has issued $250,000 worth of bonds for the construction of an electric lighting plant and other purposes.

The Benham Engineering Co., Oklahoma City, Okla., is preparing plans for an electric light plant for Wagoner, Okla.

The Rutland Railway, Light & Power Co., Rutland, Vt., is planning to erect a new power house and dam at Clarendon, Vt.

Ponca, Okla., will vote, Oct. 31, on a $30,000 bond issue, the proceeds to be used in constructing an electric light plant.

Cecil B. Smith, Winnipeg, is preparing plans for a municipal power plant to be erected at Prince Albert, Man., at a cost of $250,000.

Van Horne, Ia., has voted $10,000 worth of bonds for the construction of a light plant to replace the old one which recently burned.

The Abbott Kinney Co., Venice, Cal., is planning to erect an electric light plant at a cost of $100,000. Abbott Kinney is president.

Gravette, Ark., will soon issue $25,000 worth of bonds, the proceeds to be used in installing an electric lighting plant.

Rollins & Westover, Kansas City., Mo., are preparing plans for a municipal electric lighting plant for Osborn, Kan.

A company backed by British capital to the amount of $9,000,000 has been formed to develop power on the Deschutes river in Oregon. Leroy Park, of Portland, is at the head of the company.

The Edison Electric Illuminating Co., Boston, has acquired about ten acres of land in Dorchester, Mass., and will erect several buildings for its construction and operating departments.

James Knox Taylor, supervising architect, Washington, D. C., will receive bids until Oct. 25 for a gasoline engine and electric motor to be installed in the postoffice at London, Ky.

Vallejo, Cal., will hold an election Nov. 1 to decide on a $225,000 bond issue. One hundred and fifty thousand dollars of this will be used to construct a municipal lighting system.

Stockholders of the Penn Light & Power Co., Pittsburgh, will meet, Oct. 26, to vote on an increase in the capital stock of $350,000 to $1,000,000 to cover improvements, including the extension of power lines across the Ohio river.

The Four States Coal & Coke Co., of which David S. Jones, Pittsburgh, is president, has increased its authorized capital of $5,000,000 to $6,500,000, and is preparing plans for opening new mines and erecting a power plant at Dorothey, W. Va.

George E. Whitney, secretary of the commission, Lima, O., recently rejected bids for power equipment and revised plans and specifications are being prepared. New bids will be taken on 1,600 horsepower water tube boilers, in units of 200 horsepower each; six engines; six generators; one

11-panel switchboard; pumps, pipe, etc. F. L. Packard, Columbus, is the engineer.

The Pittsburgh Crucible Steel Co. is awarding contracts for an addition to the power plant at Midland, Pa., and for a new power plant to be erected at Rice's Landing, Pa., along the Monongahela river, where the company is developing a large tract of coal land. Ten 600-horsepower boilers will be added to the Midland plant, and six 250-horsepower boilers will be installed at the new power plant at Rice's Landing. The company has awarded the contract for the foundations for a new boiler house and coal bin at the Parks Works, Pittsburgh, to the Raymond Concrete Pile Co.

Power and other mechanical equipment will be required in the near future in connection with coal mining developments in eastern Kentucky. Among the companies which are to engage immediately in developing coal fields are the following: United States Coal & Oil Co., Holden, W. Va., which recently purchased 25,000 acres on Blackberry creek; Beech Creek Mining Co., Beech Creek, Ky., which has been incorporated with $6,000 capital stock by R. R. Kirkpatrick and others; the Interstate Coal Co., Middlesboro, Ky., which bought 800 acres in Knox county, located on Tye fork. The Consolidated Coal Co. now has under way large developments in Harlan and Letcher counties.

New Construction

C. C. Clark & Bro., Montreal, brass founders, are building a new plant.

Oliver B. Caldwell, Corpus Christi, Tex., contemplates the erection of a foundry at that place.

The Ludlow-Saylor Wire Co., St. Louis, will erect a four-story machine shop in that city.

The American Machine & Mfg. Co., Charlotte, N. C., is preparing to move its manufacturing department to Greenville, N. C.

Bids are being taken by the Buckeye Printing & Paper Box Co. on a new building to be erected at Portsmouth, O., at a cost of $18,000.

The Smith Foundry Co., Fredericton, N. B., whose foundry was badly damaged by fire some time ago, has decided to erect a new plant.

The Tampa Foundry & Machine Works, Tampa, Fla., is preparing to erect additions to its foundry and make other improvements.

The Canadian Sumner Iron Works, Vancouver, B. C., is planning to erect a foundry and iron works at Burnaby, B. C.

The G. H. Williams Co., Erie, Pa., has awarded a contract to the Pittsburgh Bridge & Iron Works for an extension to its factory.

The works department of the city of Montreal will establish a machine shop. Including equipment, the cost will be about $40,000.

The American Furnace Co., St. Louis, has awarded contracts for the erection of a two-story factory, at an estimated cost of $42,000.

The Sharon Iron & Metal Co., Sharon, Pa., which recently began operations in that district, is reported to be preparing plans for extensions to its works.

The Jones Mfg. Co., Youngstown, O., manufacturer of oil filters, etc., is understood to be looking for a site for the manufacture of sheet metal specialties.

The Otto Gas Engine Co. is contemplating the erection of an automobile factory at Mount Holly, N. J., to cost $100,000. Ballinger & Perrot, Philadelphia, are preparing plans.

The Gilbert & Barker Co., Springfield, Mass., manufacturer of boilers and gas engines, has begun the work of laying out the ground plan of a new plant.

The Defiance Pressed Steel Co., Defiance, O., has let a contract to P. A. Baker & Bro. for the erection of an addition to its plant. The price is understood to have been $25,000.

Contracts have been awarded by the Elkins Foundry & Machine Co., Elkins, W. Va., for a new building, which will contain a foundry, 32 x 60 feet, a machine shop, 32 x 60 feet, and a pattern shop, 42 x 50 feet.

The Penn Motor Car Co., which awarded a contract last week for the construction of a new plant in the New Castle, Pa., district, is in the market for a large amount of machinery and equipment.

Plans are being prepared by L. J. Dean, Huntington, W. Va., for a brick, steel and reinforced concrete building, 400 x 450 feet, to be erected at Huntington, W. Va., by the Consolidated Clay Products Co.

The Enterprise Foundry Co., San Francisco, has purchased a tract at Richmond, Cal., where a large foundry will be erected. It is expected that a plant employing about 600 men will be established.

The Cincinnati Traction Co., Cincinnati, will erect four repair shops, 150 x 200 feet each. The estimated cost, exclusive of equipment, will be $100,000. Bids for the construction will be received in a few weeks.

The Safety Mfg. Co., Moundsville, W. Va., has awarded a contract for the construction of a plant which will have a capacity of 2,000 brake shoes, daily. The company is capitalized at $75,000. F. A. O'Brien is secretary.

Andrew Kopperud, Milwaukee, manufacturer of well-drilling machinery, has purchased a site of two acres on Thirty-ninth avenue, near Lapham street, that city, and will erect a 60 x 150-foot building, at an estimated cost of $25,000.

The Cudahy Packing Co., Chicago, expects to build a new car building plant at Hammond, Ind., near Chicago, for repairing and constructing its own refrigerator and tank cars. It will replace the plant at Omaha which was recently burned.

The Penn Motor Car Co., Pittsburgh, which recently purchased a three-acre site near New Castle, Pa., has awarded a contract for the construction of a plant. The main building will be 60 x 510 feet, and will have six wings, 60 x 150 feet each.

The Wisconsin Wire Works, Appleton, Wis., is erecting a two-story cement addition, 41 x 41 feet, and will install two wide looms and two winders. This equipment will be added to in time. Electric power will be used exclusively in the new addition.

Plans have been completed for an addition to the plant of Sargent & Co., New Haven, Conn. The proposed building will be 32 x 128 feet, two stories high and constructed of brick. L. W. Robinson, architect, 324 Exchange building, New Haven, prepared the plans which call for an expenditure of about $10,000.

Paul C. Hunter, architect, 191 Ninth avenue, New York City, has filed plans at the building department for the construction of a four-story, fireproof, wagon factory on Twenty-second street, east of Eleventh avenue. The structure will be 100 x 98.9 feet, and is estimated to cost $60,000.

The Hooper-Falkenau Engineering Co., 165 Broadway, New York, has taken the general contract for the construction of a pattern storage building for the Crane Valve Co., Bridgeport, Conn. The building will be 50 x 353 feet, one story high, and equipped with mono-rail travelers for handling heavy patterns.

Plans have been filed at the New York City building department for an addition to the Baron de Hirsch Fund Trade School, on Sixty-fourth street. The extension will be six stories high and 63.6 x 72 feet. Shire & Kaufman, architects, 373 Fourth avenue, drew the plans, which will cost approximately $125,000 to carry out.

It is expected that additional machinery equipment will be installed.

Steam & Radiation, Ltd., Toronto, manufacturer of hot water boilers and radiators, will erect a plant on a site of 35 acres at St. Catherines, Ont. The foundry will be 120 x 240 feet, while a cleaning room will also be provided. The machine shop will be 200 x 200 feet. No contracts for equipment have yet been let.

The Root & Van Dervoort Engineering Co., East Moline, Ill., is erecting three buildings which will double the present output. They will include: An assembling department, 85 x 258 feet, one story; testing and painting department, 70 x 375 feet, one story and basement; casting storage shed, 70 x 80 feet, one story.

The Continental Radiator & Foundry Co., St. Louis, will erect a 200 x 800-foot plant for manufacturing radiators. The equipment will include threading, tapping and general assembling equipment; also complete equipment for the foundry. L. F. Ostrander, 1409 Olive street, St. Louis, is manager.

The Positive Clutch & Pulley Works, Buffalo, which recently purchased five acres in the new manufacturing district of North Buffalo, is preparing plans for a foundry and extensive machine shops, to be built early in spring. The company will be in the market for all kinds of foundry equipment. S. A. Benedict is treasurer and general manager.

The plant of the Thompson Iron Works, Black River Falls, Wis., was badly damaged by the flood of Oct. 6-7, which wiped out the city and caused heavy losses. The loss to the Thompson company is estimated at $12,000. A decision as to rebuilding the plant will not be made until it is determined whether or not the city will be rebuilt on its present site or farther up the hill leading to Black river.

The Kenzler-Waverly Motorcycle Co., Cambridge, Wis., and the Waverly Motor Co., Milwaukee, will consolidate their plants at Jefferson, Wis. The Promoters' Club of Jefferson donated a site sufficient for the combined needs of the two concerns and in addition pays a bonus of $3,250 and subscribes for $10,000 of the capital stock. Preliminary plans are for a main factory building, 60 x 120 feet, to be ready for operation Dec. 1. The present address of the Waverly Co. is 2229 Sycamore street, Milwaukee.

The New York Freight Terminal Co., New York City, has been incorporated under the laws of New York state to establish a model factory section upon several plots it controls in the upper part of Manhattan island, between 201st and 204th streets. It is proposed to erect a number of eight-story concrete factory structures and to provide model terminal facilities, including docks, bulk heads and railroad spurs. The plans of the company, as projected, involve an expenditure of $6,000,000 to $10,000,000.

Miscellaneous

The Standard Oil Co. is preparing to install additional pumps on its pipe line at Martinez, Cal.

The Henry Vogt Machine Co., Louisville, has sold three boilers for installation in the power plant of the Louisville Soap Co.

The Asheboro Wheelbarrow & Mfg. Co., Asheboro, N. C., is in the market for machinery for manufacturing steel wheelbarrows.

The Kentucky Electric Co., Louisville, has purchased a coal crusher and crane from the Orton-Steinbrenner Co., Chicago.

The Kentucky & Indiana Terminal Railway has let a contract for the construction of its new coal handling plant, which will have a capacity of 500 tons. The contractors are Roberts & Schaefer, Chicago.

The Nevada Mines & Selling Co., headed by F. B. House of Hawthorne, Nev., will erect an aerial tramway at Walker Lake, Nev. A large amount of concentrating machinery is also to be installed.

The plant of the Puyallup Veneer & Mill Co., which was damaged by fire at Meeker Junction, near Tacoma, Wash., entailing a loss of $160,000, will be rebuilt at once and new machinery installed.

The Optenberg Iron Works, Sheboygan, Wis., has the contract for installing elevating, cleaning and screening machinery for the Algoma Fuel Co., Algoma, Wis. The price is $2,500.

Allis-Chalmers Co., Milwaukee, has been awarded the contract for furnishing and installing a steam turbine, motor generator set and other machinery for the new garbage incinerating plant at Milwaukee. The successful bid was $12,617.

The Consolidated Expanded Metal Co., Pittsburgh, has received a contract for the walls, cement coating and metal lath for the new laboratory and additions to be erected by the National Bureau of Standards, Arsenal Park, Pittsburgh.

The General Electric Co., Schenectady, N. Y., has taken a contract to supply the electrical equipment for the proposed municipal electric light plant at Silow Spring, N. Y., consisting of a generator, exciter, switchboard and other appliances. The company will also do the necessary street wiring.

The Union Iron Works, of San Francisco, has been awarded the contract for furnishing the oil firing machinery for the Grand Trunk liners Prince Rupert and Prince George. The two vessels will be docked at the Fox Iron Works, Seattle, Wash., where the work will be done under the supervision of the experts from the Union Iron Works. The specifications call for the development of 6,000 horsepower in each vessel.

Government News

Maj. S. A. Cheney, U. S. engineer corps, San Francisco, asks for proposals for constructing two steel-hull 20-inch pump dredges, on which bids will be opened Dec. 27.

Col. W. C. Langfitt, U. S. engineer corps, Washington, D. C., will receive bids, to be opened Oct. 23, for furnishing one 30-horsepower 5-drum hoisting and swinging engine.

Bids were opened by the bureau of supplies and accounts, navy department, Oct. 10, for furnishing material and supplies for delivery at various navy yards, as follows:

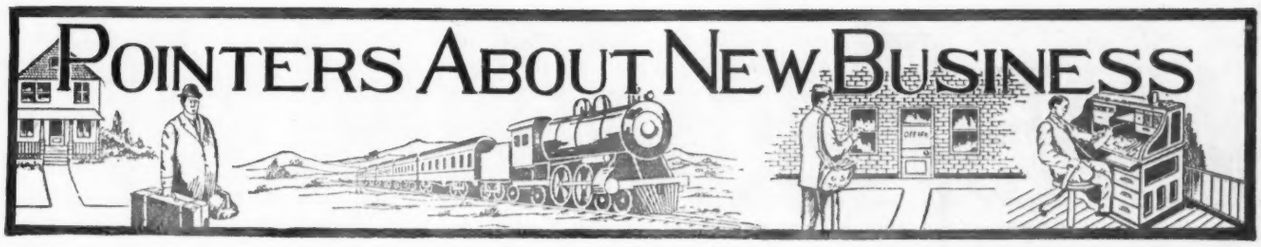
Schedule 3915, class 11, Mare Island, 1 lock-seaming machine, semi-automatic, motor-driven: E. W. Bliss Co., Brooklyn, $975; Berger & Carter Co., San Francisco, $700; Manning, Maxwell & Moore, New York, $700; Rix Compressed Air & Drill Co., San Francisco, $795 and $835, and Toledo Tool & Machine Co., Toledo, O., $446.

The bureau of yards and docks, navy department, has awarded to the Wellman-Seaver-Morgan Co., Cleveland, the contract for building the floating cranes for Boston and Pearl Harbor, Hawaii (one each), on its bid, opened June 3, of $617,000.

Bids will be opened on Nov. 14 by the bureau of supplies and accounts, navy department, for furnishing of material and supplies, for delivery at the navy yards, in accordance with the schedules numbered as indicated, as follows:

Gear, turret turning, miscellaneous Brooklyn, 4029.
Plant, oxy-hydro generating, Brooklyn, 4031.
Riveter and punch, 1, Philadelphia, 4030.

The officer in charge of defensive works, Manila, P. I., will receive bids until 10 o'clock, Dec. 4, for furnishing condensers, pumps, feed-water heater, and forced-draft fans, water tube boilers, engines, generators, synchronous converters and potential transformers. Information will be furnished by the chief of engineers, U. S. A., Washington.



(In order to assist the post office in delivering letters to new concerns, it is suggested that the names of incorporators be written in the lower left hand part of every envelope addressed to such new companies.)

New Buyers

The following manufacturing companies have filed articles of incorporation:

The Standard Iron Works, Spartansburg, S. C.; $20,000; by W. B. Cook and others.

Parker Bros. Iron Co., Boston; $50,000; by Laurie F. Parker, John H. Parker and Harry R. Healey.

Waterbury Welding Co., Waterbury, Conn.; $5,000; by Earl S. Ross, Arthur F. Ellis and Gustav A. Becker.

The Galey Nut Lock Co., Jackson, Tenn.; $100,000; by W. F. Lamb, W. T. Peter, J. D. Newton, C. D. Siler and C. E. Pigford.

Lakeside Forge Co., Erie, Pa.; $100,000; to manufacture iron and steel forgings; by Treasurer Frederick Bell McBrier, Erie.

The Ashland Wrench Co., Ashland, O.; $15,000; to manufacture a new type of wrench; by John Gabrill, Samuel Milier and others.

Branford Foundry Co., Inc., Branford, Conn.; $2,000; by Walter G. Schall, John J. V. Cunningham, Peter J. Carney and Michael P. Rice.

The American Gas Engine Co., Los Angeles; $150,000; by directors, F. H. Coles, R. B. Bailey, D. C. Narver, R. F. Coles and D. L. Narver.

Copp Stove Co., Ltd., Fort William, Ont.; $300,000; by provisional directors, Joseph A. Kilpatrick, Frederick W. King, Charles L. Job and others.

The Burke Valve Co., Cleveland; $50,000; to manufacture valves; by W. R. Burke, William G. Rose, T. H. Duncan, William H. West and Fred C. Backus.

The Electric Lap Welding Co., Cleveland; $50,000; by George H. Tyler, George W. Boesel, H. G. Stacey, W. E. Gray, R. F. Nailler and H. C. Johnson.

The Paul Lacroix Automobile Co., Manhattan, New York City; $10,000; to manufacture and deal in motor vehicles; by Paul Lacroix, 353 West Eighty-fifth street; Harry U. Kibbe, 258 Riverside drive; Harvey T. Andrews, 35 Mount Morris Park West, all of New York City.

The Albion Tool Co., Los Angeles; $50,000; to manufacture steel tools of various sorts; by directors, H. L. McNair, Wilfred M. Peck and William Fleet Palmer.

Victor Shoe Machinery Co., Boston; $250,000; by Edwin Shivell, Melrose; William O. Lane, Somerville; Charles F. Dutch, Tremont building, Boston.

Voting Machine Co., Hoboken, N. J.; $350,000; to manufacture voting machines; by Samuel R. Shoup, J. George Fischer, Richard C. Shoup, all of Hoboken.

Columbia Screw Co., Boston; $50,000; to manufacture screws; by James E. Crane, Boston; John P. Hoyting, Wyoming; Robert J. Crane, Boston; J. J. Moore, Boston.

Joseph Bardsley Mfg. Co., Jersey City, N. J.; $30,000; to manufacture hardware specialties; by Edwin F. Britten Jr., William T. Wright and Thomas F Meaney Jr.

Crouse-Hinds Co. of Canada, Ltd., Toronto; $100,000; machinist and general contractor; by provisional directors, Huntingdon B. Crouse, Wm. L. Hinds and Edward G. Mack.

Montclair Mfg. & Machine Co., Ltd., Bridgeville, Pa.; $5,000; to manufacture trolley wheels, pulleys and mechanical appliances; by Treasurer H. W. Crouch, Bridgeville.

Borland Mfg. Co., Cincinnati; $150,000; to manufacture car wheels and wrenches; by J. Archer Borland, G. A. Hoffelder, E. W. Hobermaas, H. L. Hogan and Otto Klein.

The Howes Machinery Co., San Francisco; $50,000; to do a general machinery business; by directors, W. E. Howes, H. A. Norman, E. E. Howes, C. C. Cunningham and A. G. Cunningham.

The Ideal Wrapping Machine Co., Middletown, N. Y.; $150,000; to manufacture wrapping machines, etc.; by Olin S. Fellows, Archibald E. Hopkins, Fred B. Williams, all of Middletown, N. Y.

Harbeck Motors Co., Chicago; $50,000; to manufacture motors and hardwood specialties; by A. T. Ewing, E. S. Hartman, Chas. Bednorz, Adlai T. Ewing, 809 Stock Exchange building, Chicago.

Ideal Faucet & Valve Co., Springfield, Mass.; $50,000; to manufacture faucets; by Edward H. Cullen, Springfield; William J. Dunn and John T. Moriarty, both of Chicopee Falls, Mass.

Safety Lamp & Metal Mfg. Co., Pittsburgh, Pa.; $20,000; by Treasurer Alexander Little, 209 Seventh street, Pittsburgh; directors, Alexander Little, Peter Glick, Pittsburgh; H. L. Little, Homestead, Pa.

The Bessemer Motor Truck Co., Grove City, Pa.; $100,000; by Treasurer I. M. Lewis, Grove City, Pa.; directors, James E. Marshall, Butler, Pa.; E. J. Fithian, L. M. Monroe, I. M. Lewis, W. H. Shellito, all of Grove City.

Ackley Brake & Supply Co., Manhattan, New York City; $50,000; to manufacture brakes for street railways, etc.; by Griffin S. Ackley and John C. Raymond of Hudson Terminal building, New York City, and Helen T. Ackley, Elmwood avenue and Anderson place.

The Motor Specialties Co., Oswego, N. Y.; $175,000; to manufacture motors, engines, motor vehicles and boats, etc.; by Arthur Lovell, Plainfield, N. J.; Howard H. Williams, 31 Nassau street, New York City; H. V. Walsh, 551 Lafayette avenue, Brooklyn.

General Industrial

The Smith & Baldridge Machine Co., Detroit, has increased its capital stock from $50,000 to $90,000.

The Standard Boiler Works has been incorporated at Portland, Ore., with a capital stock of $5,000.

The Marion Shovel & Dredge Co., Marion, O., has changed its name to the Marion Osgood Co.

The Corry Metal Furniture Co., Corry, Pa., has increased its capital stock from $50,000 to $100,000.

The Rockford Machine Tool Co., Rockford, Ill., has increased its capital stock from $65,000 to $100,000.

The Southern Stamping & Mfg. Co., Nashville, Tenn., has increased

its capital stock from $10,000 to $25,000.

The Pittsburgh Bridge & Iron Works, Pittsburgh, has filed notice of increase of capital stock from $100,000 to $200,000.

The Vesper Safety Clevis & Malleable Iron Co., of Vesper, Wis., has asked creditors to petition for the appointment of a receiver.

The Steel Co. of Canada is building a new fire brick stove at its Hamilton, Ont., blast furnace plant. Frank C. Roberts & Co., Philadelphia, are the engineers.

The Warren Foundry Co., Warren, Pa., has taken an order for 20 tank cars of a capacity of 500 barrels each, for the Independent High Grade Oil Refining Co., Pittsburgh.

J. D. Leary has been appointed receiver of the Joseph Goldenberger Iron Co., Cincinnati, by petition of the Market National Bank, a judgment creditor for $2,537.50. The receiver is to take charge of the assets and make a separate appraisement.

The American Hollow Steel Sash Co. will operate a factory at Tioga and Aramingo streets, Philadelphia. Its product will be hollow, one-piece window sash. All orders for equipment have been placed and machinery is being installed.

The Weather Proofing Nail Co., Baltimore, Md., will galvanize its full line of Capnal "Never-leak" wire roofing nails by the hot process, and also re-galvanize after manufacture. Its plain products will consist of placard, sign and sheathing paper nails.

The Blaisdell-Canady Co., 90 West street, New York City, advises that it was recently incorporated for the purpose of manufacturing forced draft equipments with regulating devices for same, and for the installation and general equipment of steam boiler furnaces.

The American Device Co., 444 Equitable building, Baltimore, will manufacture stationary and locomotive furnace devices. The company was recently incorporated with a capital stock of $10,000, the officers being: President and manager, John Bolgiano; secretary, Samuel E. Pentz; treasurer, Frank H. Shallus.

The Curlew Novelty Co., 6022 Maple avenue, St. Louis, which was recently incorporated with a capital stock of $10,000, will manufacture collapsible drinking cups. The officers of the company are: President, Samuel Curtis; vice president and treasurer, Edward T. Klippel; secretary, A. B. Lewis.

The Granger Electric & Mfg. Co., Warren, Ind., advises that it will manufacture new electric devices, among which will be an immersion coil, instantaneous heater, branding irons, etc., and also a warming pad to take the place of hot water bottles. The plant has been fully equipped, and from 100 to 300 of these devices can be produced daily.

The new plant of the North Dakota Welding & Mfg. Co., at Forum, N. D., is being rapidly completed and will be in operation in a short time. The plant is being removed to Forum from New Rockford, N. D., and all that remains to be done is to transfer the machinery as well as install several new machines. The company does welding of all kinds with a portable welder.

The plans for the new buildings and equipment for the Merchants Motor Co., Newark, N. J., are in the hands of a building committee, and will be submitted for acceptance shortly. The company was recently incorporated with a capital stock of $500,000 and will build trucks of a capacity of one and a half to three and five tons. The output will be limited at first.

The Onondaga Brass Co., Syracuse, N. Y., recently incorporated, advises that it will not need any new equipment, that no new buildings are contemplated at present, and that no change will be made in its official personnel. The officers of the company are: President and treasurer, H. Mahley; secretary and general manager, L. F. Meagley; vice president and superintendent, J. Underdown.

The International Automatic Signal Co., Kansas City, Mo., whose incorporation was recently noted, advises that it will do a regular signaling business with both steam and electric lines. The company's product will be an electric cab signal with an automatic stop, which can be used in connection with the present interlocking and block signals. A branch office will also be opened in Chicago early in November.

The Blair Mfg. Co., Newark, O., whose incorporation was recently noted, advises that it will occupy the plant of the Newark Machine Co., continuing the manufacturing of the Newark company's line of agricultural implements. It will also manufacture the Blair direct motor trucks with Blair patented three point suspension subsidiary frames, enabling the use of a direct drive with no chains. The Blair company will require some new machinery which has been already purchased.

The Aiken Steel Tie Co., Sumner, Mo., whose incorporation was recently noted, advises that its plans for the future are not as yet completed. A sample of the steel tie that it manufactures is being tried on the main line of a large western railroad, and future operations are pending upon this and other similar trials. The officers of the company are: President, John D. Stoner; vice president and business manager, John H. Aiken; treasurer, John T. McCormick, and secretary, C. M. Hopper.

The Stephenson Charcoal Iron Co., of Wells, Mich., has placed the following contracts for work in connection with its proposed blast furnace plant: Plate work, structural work and boilers, Muskegon Boiler Works, Muskegon, Mich.; hot blast stoves, Lake Shore Engine Works, Marquette; blowing engine, Weimer Machine Works Co., Lebanon, Pa.; pumping machinery, Henry R. Worthington Co., Philadelphia; hoist equipment, Otis Elevator Co., Pittsburgh. The foundations for the plant are nearing completion and the construction of the buildings is well under way. Frank C. Roberts & Co., Philadelphia, are the engineers for the company.

Trade Notes

The Brown Hoisting Machinery Co., Cleveland, has announced the opening of its Chicago office in the Commercial National Bank building, with A. M. Merryweather as manager.

The Kelly Reamer Co., Cleveland, manufacturer of adjustable floating or rigid reamers, recently established the following offices: New York City, 96 and 98 Reade street; Boston, 170 Oliver street; London, Eng., 112 Queen Victoria street.

The Buffalo Pitts Co., of Buffalo, and the Seager Engine Works, of Lansing, Mich., have jointly appointed as manager of their interests in the southwest, R. B. George, with offices located at 813-819 Willow street, Houston, Tex. Both companies manufacture gasoline engines from one to fifty horsepower.

Fires

The foundry of the Perkins Windmill Co.'s plant, at Mishawaka, Ind., was slightly damaged by fire recently. The loss was of no consequence, and the work at the plant has not been impaired.

The Thompson Iron Works, 1825 Callowhill street, Philadelphia, suffered a slight damage from a fire recently. The loss was only a small one, and the operation of the plant was not hindered in any way.